

REVISED**VHS VIDEO CASSETTE RECORDER**

**VC-M730E, VC-77EN/ES, VC-N80,
VC-774E, VC-780E, VC-79ETN,
MODELS VC-790ET, VC-770E**

This manual is a revision of the schematic diagram of the Power Unit (RDENC0394GEZZ) for the video cassette recorder. This manual reflects parts changes and correction of errors in the original service manual.

CONTENTS

- REPLACEMENT PARTS LIST 2
- SCHEMATIC DIAGRAM POWER 3
- POWER PWB 5

SHARP CORPORATION

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by Δ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

Δ MARK: SAFETY RELATED PARTS

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

POWER CIRCUIT

RDENC0394GEZZ Power Board Assembly —

TRANSISTOR

Δ Q901 95KUAD0046AZ 2SD882 AH

INTEGRATED CIRCUITS

Δ IC901 95KUCC0042AZ STRD1806 AR
 Δ IC902 95KUCB0077AZ PQ30RV11 AH

DIODES

Δ D901, 95KUBC0213FZ RL156 AC
 Δ 902,
 Δ 903,
 Δ 904
 Δ D905 95KUBC0214BZ R1200F AC
 Δ D906 95KUBC0178AZ D1NL20 AD
 Δ D907 95KUBC0150AZ 11ES1 AB
 Δ D908 95KUBA0005AZ 1SS55 AB
 Δ D909 95KUBC0143AA EU1Z AD
 Δ D910 95KUBC0212AZ SF22 AE
 Δ 912
 Δ D911, 95KUBC0182CZ 10ELS4 AD
 Δ 913,
 Δ 914
 Δ D915 95KUBDAC8R2C RD8.2ESAB2 AB

Ref. No.	Part No.	Description	Code
COILS AND TRANSFORMER			
Δ L901	95KUKZ0328ZZ	Line filter	AB
L902	95KUKZ0251ZZ	Chook coil	AE
L903	95KUKZ0102ZZ	Coil	AC
L904	95KUKZ0257ZZ	Coil	AE
L905,	95KUKZ0312ZZ	Coil	AF
906			
Δ L907,	95KUZZ0011ZZ	Coil	AD
Δ 908			
Δ T901	95K829035010	Power transformer	AY

CAPACITORS

Δ C901	95KUGZ0687ZZ	0.1 μ F, 250V, Ceramic	AB
Δ C902	95KUGZ0662ZZ	0.047 μ F, 250V, Ceramic	AE
Δ C903	95KUGBQ680BT	68 μ F, 400V, Electrolytic	AP
Δ C904,	95KUGCZ101AB	100pF, 1KV, Ceramic	AC
905			
Δ C906	95KUGAQ010DC	1 μ F, 400V, Electrolytic	AP
C907	95KUGAJ100BU	10 μ F, 100V, Electrolytic	AC
Δ C910	95KUGAC101DC	100 μ F, 16V, Electrolytic	AB
C912	95KUGFJ102AR	1000pF, 100V, Ceramic	AB
Δ C913	95KUGAC100EG	10 μ F, 16V, Electrolytic	AF
C914	95KUGCZ471AA	470pF, 500V, Ceramic	AB
C915	95KUGAD102DU	1000 μ F, 25V, Electrolytic	AF
C917	95KUGAC102BU	1000pF, 100V, Electrolytic	AE
Δ C918	95KUGAJ220DC	22 μ F, 100V, Electrolytic	AD
C923	95KUGAJ2R2BU	2.2 μ F, 100V, Electrolytic	AB
Δ C927,	95KUGCZ471BT	470pF, 4KV, Ceramic	AC
Δ 931			
Δ C928	95KUGCZ102BP	1000pF, 4KV, Ceramic	AD

RESISTORS

Δ R901,	95KUECC685AB	6.8Mohm, 1/2W, Solid	AB
Δ 902			
Δ R903	95KUEFG5R6AA	5.6ohm, 5W, Resistor	AD
Δ R904	95KUEBBR39AF	0.39ohm, 1/4W, Fusible resistor	AC
Δ R913	95KUEFCR39AK	0.39ohm, 1/2W, Resistor	AA
Δ R922,	95KUEEC271AK	270ohm, 1/2W, Resistor	AA
923,			
924,			
925			
Δ R927	95KUEBB4R7AC	4.7ohm, 1/4W, Fusible resistor	AC
Δ R929	95KUEBBR39AF	0.39ohm, 1/4W, Fusible resistor	AC
R930	95KUEZ0403ZZ	6.8ohm, 1/2W, Metal oxide	AE
Δ R931,	95KUEBBR47AF	0.47ohm, 1/4W, Fusible resistor	AC
Δ 932			

MISCELLANEOUS

Δ	QAC CZ3005GEZZ	AC Cord (VC-M730E, VC-774E)	AM
Δ	QAC CV2024GEZZ	AC Cord (VC-77EN, VC-780E, VC-770E, VC-N80)	AM
Δ	QAC CZ3009GEZZ	AC Cord (VC-77ES, VC-79ETN, VC-790ET)	AL
Δ F901	95KPJCTB2001	Fuse, T2A, 250V	AD
Δ ICP901	95KPJCB81001	SSFR1A, 125V	AE
FB901	95KBFZ89209Z	Ferrite Bead	AB
902,			
903			
PA	95KPKZ0529ZZ	Plug, 9 pin	AD
PB	95KPKZ0522ZZ	Plug, 2 pin	AB
PC	95KPKZ0194ZZ	Plug, 2 pin	AC

SERVICE MANUAL

S69H4VC-N80 //

VIDEO CASSETTE RECORDER

MODEL VC-N80

Note :

As this service manual is only a minor change version of the service manual previously issued for the model VC-780E, basically refer to the said service manual when servicing.

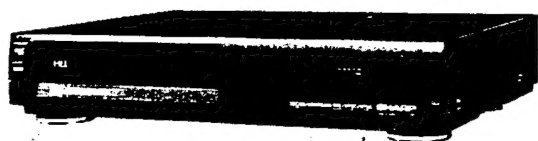
DIFFERENCE OF PARTS LIST BETWEEN VC-780E AND VC-N80

※PAGE on original MODEL VC-780E Service Manual stated.

PAGE	REF NO.	DESCRIPTION	PART No. (VC-780E)	PART No. (VC-N80)	PRICE
80		Operation manual	TINS-1308GEZZ	TINS-1416GEZZ	AM
81	18	Cam Switch	QSW-R0023GEZZ	QSW-R0026GEZZ	AE
81	97	Full Flat Cable	QCNW-5313GEZZ	QCNW-5720GEZZ	AH
81	24	Master Cam	NGERH1118GEZZ	NGERH1129GEZZ	AC
82	305	Cassette Cover Arm	MARMP0038GEZZ	MARMP0038GE00	AA
82	201	Adjusting Nut	LX-NZ3039GEZZ	XNFS20-16000	AA
82	213	Adjusting Nut	LX-NZ4043GEFW	LX-NZ3043GEFW	AB
82	217	Screw S2.6P+3S	XBPSD26P03000	XHPSD26P03000	AA
83	502	Door	GDORF1597GES	GDORF1694GESA	AH
83	500	Front Panel Ass'y	CPNLC1578GE01	CPNLC1578GE03	BA
83	619	Model label	TLABM1736GEZZ	TLABM1867GEZZ	AB
88		Packing case	SPAKC1553GEZZ	SPAKC1676GEZZ	—
88		No. Card	TLABK1736GEZZ	TLABK1867GEZZ	—

SHARP**SERVICE MANUAL**

S29X6VC-780E/

VHS VIDEO CASSETTE RECORDER**MODELS VC-780E
VC-790ET**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

	page
• SPECIFICATIONS	2
• DISASSEMBLY AND REASSEMBLY	3
• LOCATION OF MECHANICAL PARTS	4
• ADJUSTMENT, REPLACEMENT, ASSEMBLING AND TOOLS NECESSARY FOR MECHANICAL ADJUSTMENT	6
• ADJUSTMENT OF ELECTRICAL CIRCUITRY	25
• TROUBLESHOOTING GUIDE	36
• OTHER TROUBLESHOOTING GUIDE	41
• WAVE FORMS	43
• OVERALL SCHEMATIC DIAGRAM	45
• SCHEMATIC DIAGRAMS	47
• WIRING SIDE PWBs	65
• REPLACEMENT PARTS LIST	71
• EXPLODE VIEWS	84
• PACKING OF THE SET	88

SHARP CORPORATION

7318

SPECIFICATIONS

Format:	VHS standard
Video recording system:	Rotary two-head helical scan system with slant double-azimuth combination video head.
Video signal:	PAL: PAL System-B/G (P.B/REC)
	PAL: PAL System-I (P.B/REC)
	PAL: PAL System-D (P.B/REC)
	SECAM: MESECAM System (P.B/REC)
	SECAM: SECAM System-B/G (P.B/REC)
	SECAM: SECAM System-D/K (P.B/REC)
	NTSC: NTSC 4.43 (P.B/REC)
	NTSC: NTSC 3.58 (P.B/REC)
Recording playing time:	240 min max. with SHARP E-240 tape (PAL/MESECAM/SECAM in SP mode)
	8 hours max. with SHARP E-240 tape (PAL/MESECAM/SECAM in LP mode)
	160 min max. with SHARP T-160 tape (NTSC in SP mode)
	320 min max. with SHARP T-160 tape (NTSC in LP mode)
	8 hours max. with SHARP T-160 tape (NTSC in EP mode)
Tape width:	12.7 mm
Tape speed:	23.39 mm/sec. (PAL in SP mode) 33.35mm/msec. (NTSC in SP mode)
	11.7mm/sec. (PAL in LP mode) 16.68mm/sec. (NTSC in LP mode)
	11.12 mm/sec. (NTSC in EP mode)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF E2~ E12, (44.25MHz ~294.25MHz)
	UHF E21~ E69, (471.25MHz ~885.25MHz)
RF converter output signal:	UHF Channel E30 ~ E39 (adjustable). Preset to Channel E36
	UHF Channel US26~US38(adjustable). Preset to Channel US34
	UHF Channel J25~J37 (adjustable). Preset to Channel J33
Power requirement:	AC 100~240V, AUTO 50/60 Hz
Power consumption:	Approx. 23W (at AC 220V 50Hz)
Operating temperture:	5°C to 40°C
Storage temperature:	- 20°C to 55°C
Weight:	5.8 kg
Dimensions:	430 mm (W) x 350 mm (D) x 89 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
AUDIO	0 dB = 0.775 Vrms
Input:	Line: - 8 dB, more than 50k ohm
Output:	Line: - 5 dB, less than 1k ohm
AUDIO	0 dB = 0.775 Vrms
Input:	Line: - 3.8 dB, more than 50k ohm
Output:	Line: - 3.8 dB, less than 1k ohm
Accessories included:	Antenna 75 ohm coaxial connector cable (plug provided)
	Operation Manual
	Infrared Remote control

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45222 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

TECHNICAL REPORT

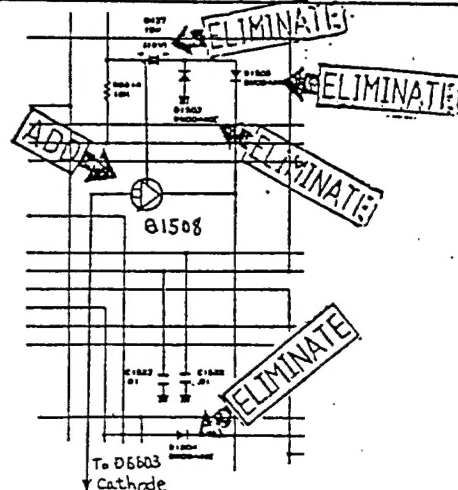
SUBJECT: Change of Parts

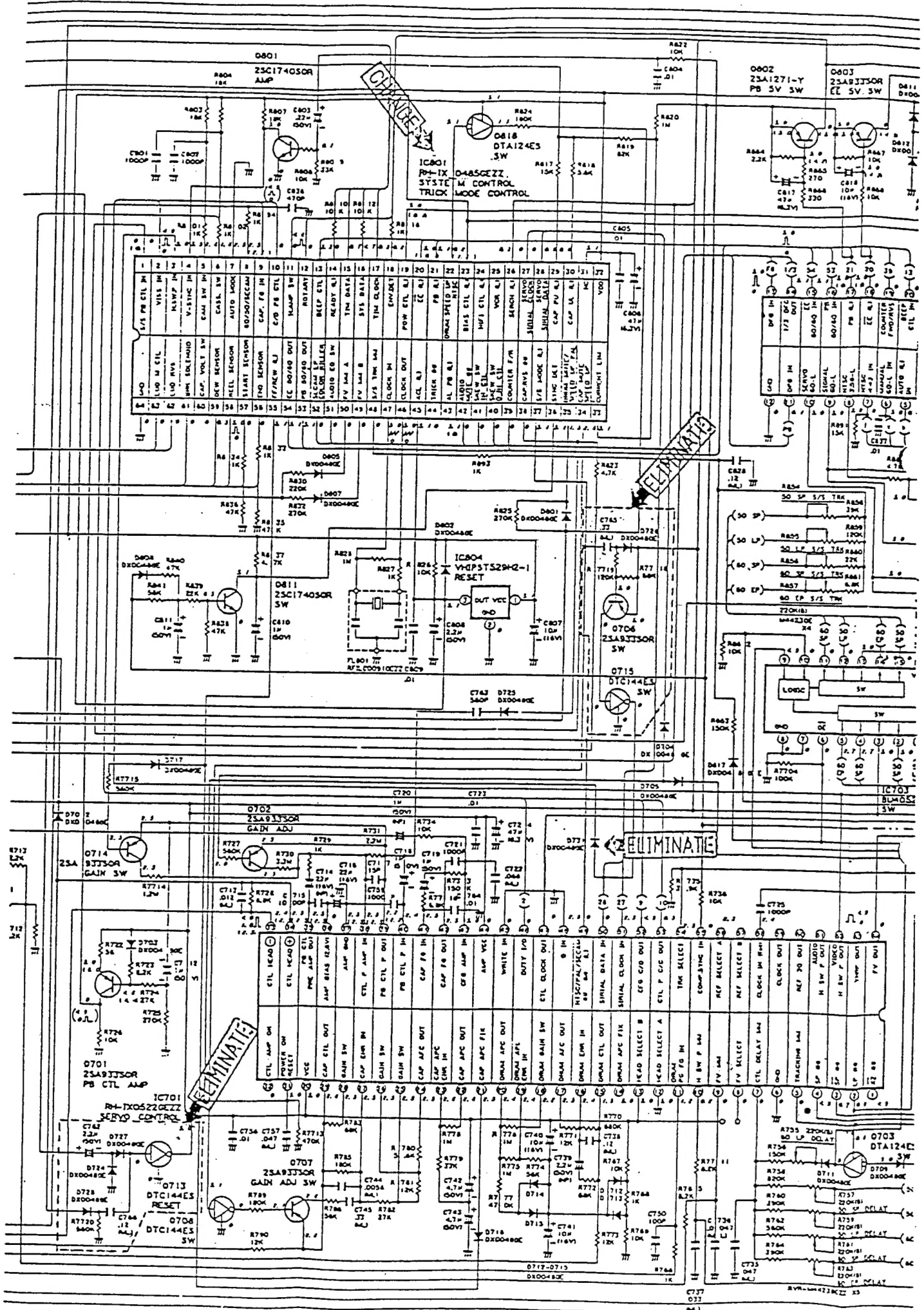
No. : EEV-388
DATE: May 24, 1989
FROM: Q.R.C.Center
TV & VIDEO SYSTEMS GROUP

The following parts have been changed. Please note this information for your service.

Models	Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.			
	VC-780E	317500~	VC-790ET	330932~	-	-			
	-	-	-	-	-	-			
Reason for Change ①	1. To improve performance 2. Change of material or dimension 3. To meet approved specification 4. To meet approved regulation 5. Standardization 6. Correction of printed matter 7. Others								
Inter-changeability ②	A. Completely interchangeable B. Interchangeable from OLD to NEW C. Interchangeable from NEW to OLD D. Not interchangeable								
	OLD ↔ NEW		OLD → NEW		OLD ← NEW				
	OLD X NEW								
Ref. No.	Description	O L D		N E W		①	②	Effective from	Price Code
		Parts No.	QTY	Parts No.	QTY				
	Syscon , Servo	DUNTK3027HE51	1	DUNTK3027HE55	1	1	D	May ,1989 Prod.	-
IC801		RH-IX0485GEZZ	1	RH-IX0573GEZZ	1	1	C		AX
Q706	2SA933SQR	VS2SA933SQR1E	1	Eliminated	-	1	-		-
Q713,715	DTC144ES	VSDTC144ES-1	2	Eliminated	-	1	-		-
D724,726 727,728,731	DX0048GE	RH-DX0048GEZZ	5	Eliminated	-	1	-		-
C762	2.2μF	VCEAEA1HW225M	1	Eliminated	-	1	-		-
C765	0.33μF (ML)	VCFYSA1HB334J	1	Eliminated	-	1	-		-
C766	0.12μF (ML)	VCFYSA1HB124J	1	Eliminated	-	1	-		-
R7718	68kohm	VRD-RA2BE683J	1	Eliminated	-	1	-		-
R7719	120kohm	VRD-RA2BE124J	1	Eliminated	-	1	-		-
R7720	560kohm	VRD-RA2BE564J	1	Eliminated	-	1	-		-
	Main (1)	DUNTK3026TM51	1	DUNTK3026TM55	1	1	D		-
Q1508	DTA144ES	Not used	-	VSDTA144ES-1	1	1	-		AB
D1503,1504 1505	DX0048GE	RH-DX0048GEZZ	3	Eliminated	-	1	-		-
C437	10μF	VCEAEA1CW106M	1	Eliminated	-	1	-		-

Main(1)





TECHNICAL REPORT

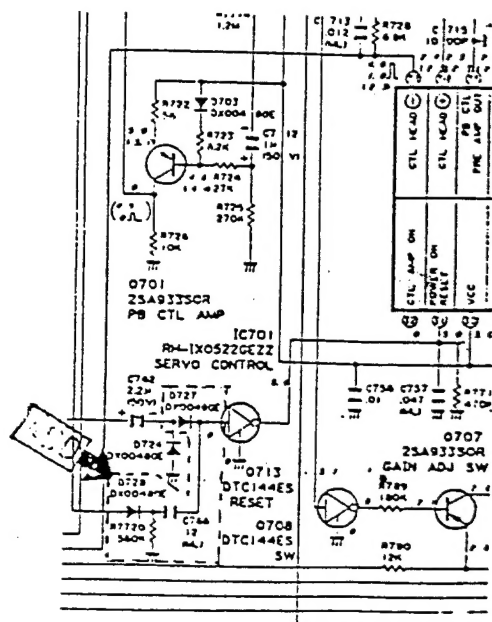
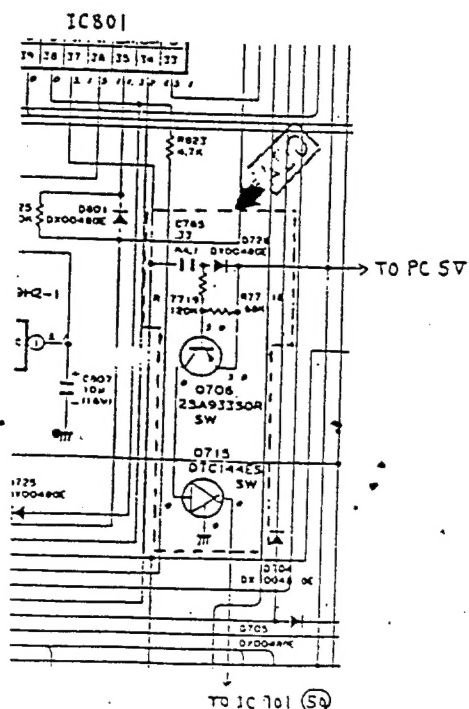
SUBJECT: Correction of Schematic Diagram

No. :EEV-386
DATE: May 23,1989
FROM: Q.R.C.Center
TV & VIDEO SYSTEMS GROUP

The following parts have been changed. Please note this information for your service.

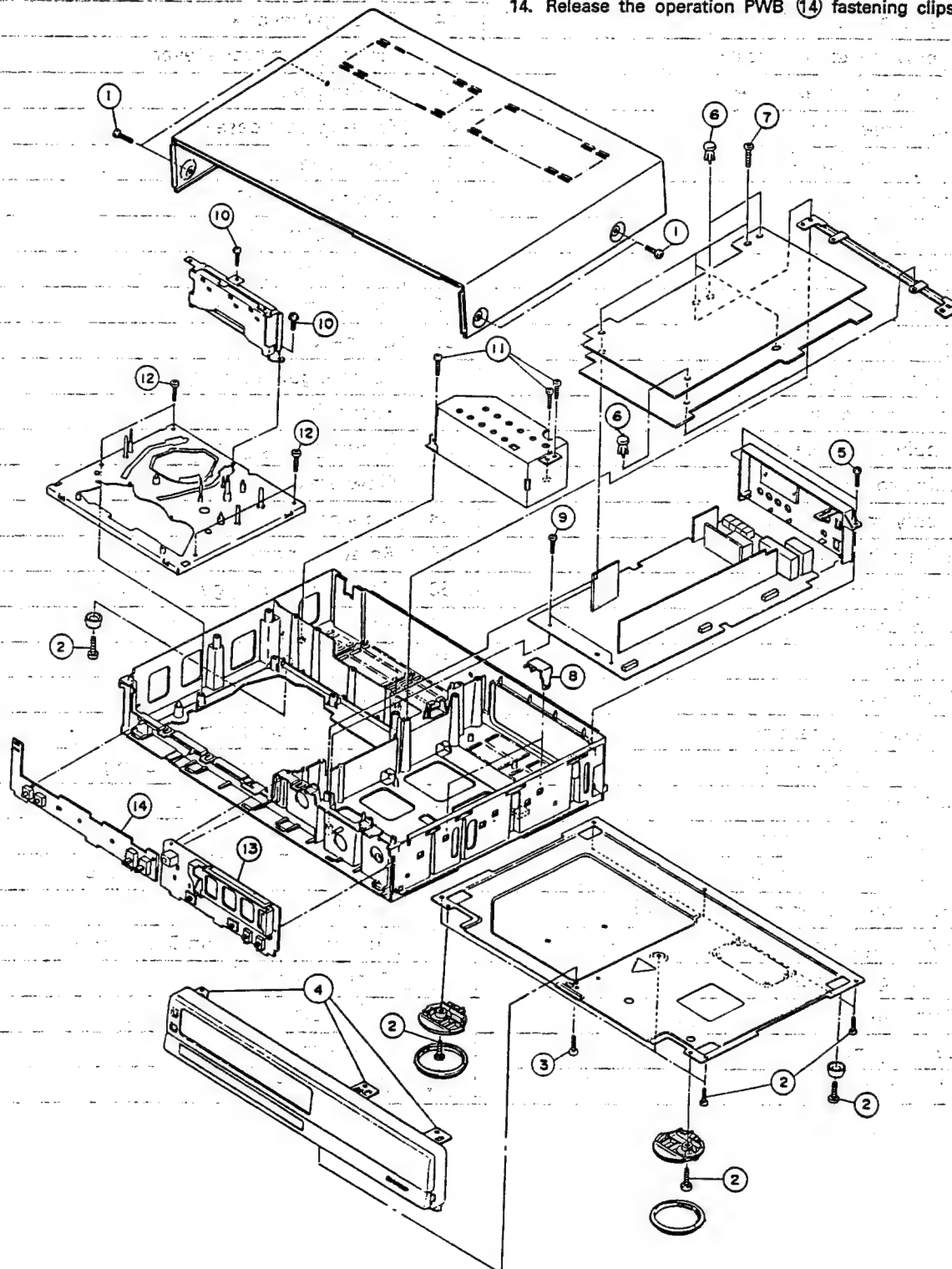
Models	Model No.	Serial No.	Model No.	Serial No.	Model No.	Serial No.			
	VC-780E	-	VC-790ET	-	-	-			
	-	-	-	-	-	-			
Reason for Change ①	1. To improve performance 2. Change of material or dimension 3. To meet approved specification 4. To meet approved regulation 5. Standardization 6. Correction of printed matter 7. Others								
Inter-changeability ②	A. Completely interchangeable B. Interchangeable from OLD to NEW C. Interchangeable from NEW to OLD D. Not interchangeable								
	OLD ↔ NEW		OLD → NEW		OLD ← NEW				
	OLD X NEW								
Ref. No.	Description	O L D		N E W		①	②	Effective from	Price Code
		Parts No.	QTY	Parts No.	QTY				
Q706	2SA933SQR	Not Listed	-	VS2SA933SQR1E	1	6	-	-	AB
Q715	DTC144ES	Not Listed	-	VSDTC144ES-1	1	6	-		AB
D726	DX0048GE	Not Listed	-	RH-DX0048GEZZ	1	6	-		AA
C765	0.33μF (ML)	Not Listed	-	VCFYSA1HB334J	1	6	-		AB
R7718	68kohm	Not Listed	-	VRD-RA2BE683J	1	6	-		AA
R7719	120kohm	Not Listed	-	VRD-RA2BE124J	1	6	-		AA
D727,728	DX0048GE	Not Listed	-	RH-DX0048GEZZ	2	6	-		AA
C766	0.12μF (ML)	Not Listed	-	VCFYSA1HB124J	1	6	-		AB
R7720	560kohm	Not Listed	-	VRD-RA2BE564J	1	6	-		AA

Note:Refer to Service Manual Page 51,52 System Control, Servo Circuit



DISASSEMBLY AND REASSEMBLY

1. Remove the four upper cabinet fastening screws ①.
2. Remove the six bottom panel fastening screws ②.
3. Remove the one front panel fastening screw ③.
4. Release the three clips ④ and remove the front panel.
5. Remove the two antenna terminal cover fastening screws ⑤.
6. Remove the two push rivets which fasten the syscon servo unit and the angle.
7. Remove the four syscon servo unit fastening screws ⑦.
8. Remove the Y/C PWB holder ⑧.
9. Remove the two main PWB fastening screws ⑨.
10. Remove the two head amp PWB fastening screws ⑩.
11. Remove the three power unit fastening screws ⑪.
12. Remove the four mechanism chassis fastening screws ⑫.
13. Release the timer PWB ⑬ fastening clips.
14. Release the operation PWB ⑭ fastening clips.

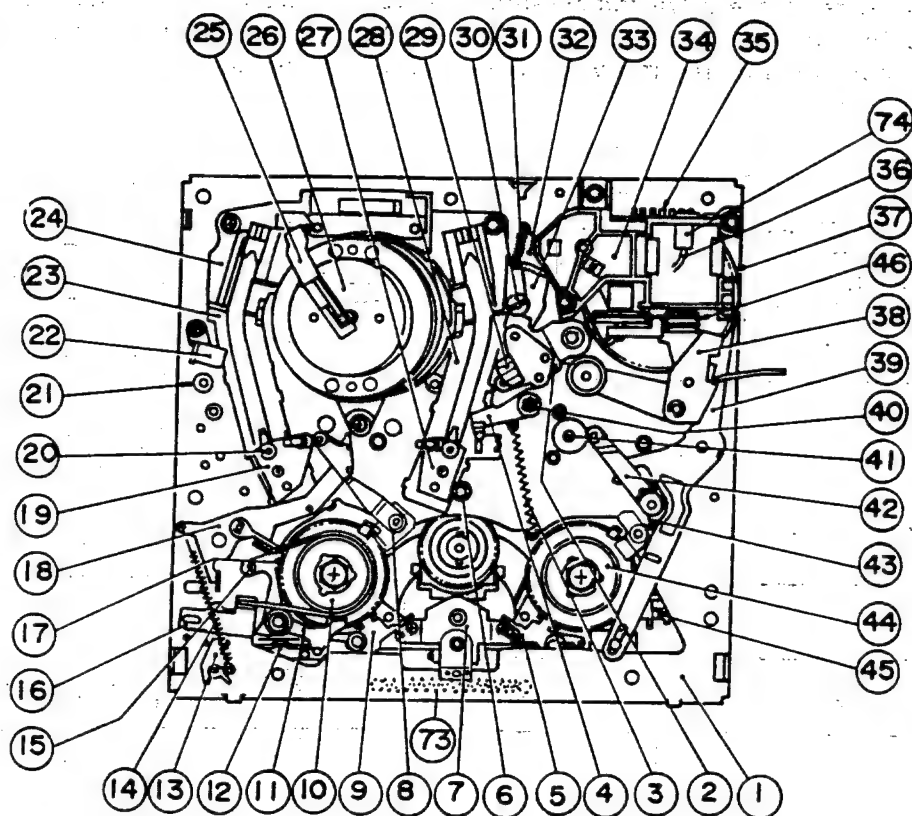


LOCATION LIST OF MECHANICAL PARTS

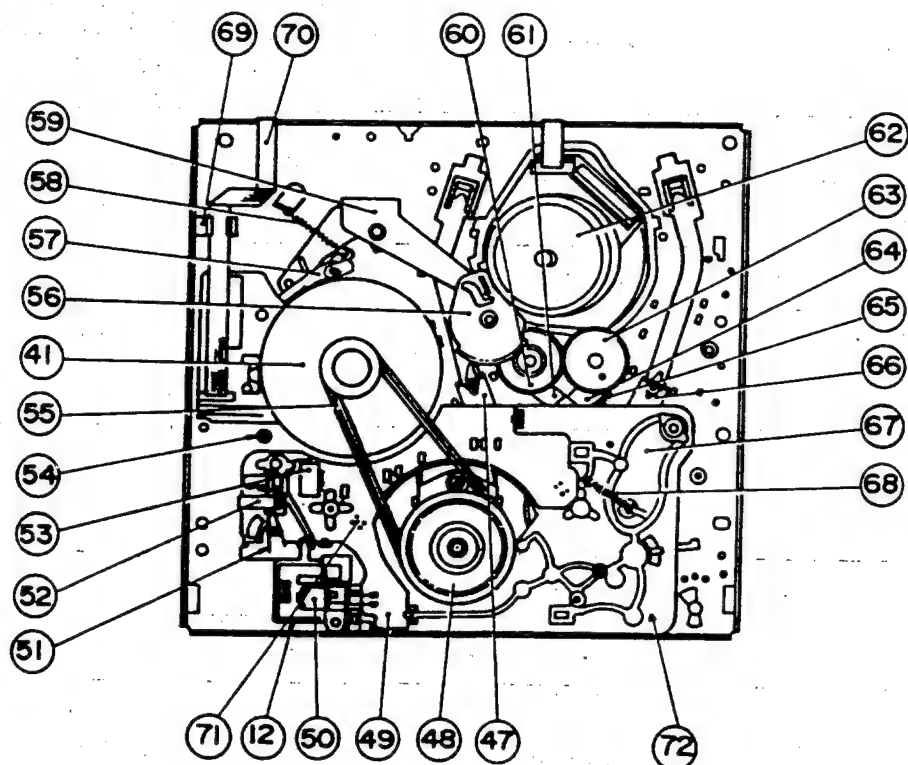
No.	Part Name	No.	Part Name
1	Main chassis ass'y	38	Pinch roller lever ass'y
2	A/C head arm	39	Relay shifter lever
3	Half-loading lever spring	40	Retaining guide
4	Half-loading lever	41	Capstan D.D.motor
5	Main take-up brake lever	42	Reverse guide
6	Cassette LED	43	Reverse guide spring
7	Idler gear ass'y	44	Take-up reel disk
8	Supply reel stopper ass'y	45	Video search brake lever
9	Main supply brake lever	46	Loading belt
10	Supply reel disk	47	Take-up pole base slider
11	Back tension lever	48	Reel pulley
12	Brake shifter	49	Reel sensor PWB
13	Tension spring hook plate	50	Brake solenoid
14	Tension spring	51	Shifter spring
15	Tension release lever	52	Shifter spring cover
16	Tension band ass'y	53	Connector
17	Auxiliary fast forward brake lever	54	Reverse guide spring
18	Tension arm ass'y	55	Reel belt
19	Supply pole base ass'y	56	Loading relay gear
20	Guide roller ass'y	57	Slow brake lever
21	Supply impedance roller	58	Slow brake spring
22	Full erase head ass'y	59	Relay gear drive lever
23	Supply loading rail	60	Take-up loading gear
24	Drum base	61	Take-up loading arm ass'y
25	Earth brush ass'y	62	Drum D.D. motor ass'y
26	Drum ass'y	63	Supply loading gear
27	Take-up pole base ass'y	64	Supply loading arm ass'y
28	Take-up loading rail	65	Loading reciprocating spring
29	A/C head ass'y	66	Supply pole base slider
30	X-position adjusting nut	67	Reel block chassis
31	Half-loading reciprocating spring	68	Auxiliary fast forward brake spring
32	Half-loading reciprocating lever	69	Full flat cable holder
33	Half-loading drive lever	70	Full flat cable(Drum D.D. motor)
34	Loading block ass'y	71	Reel sensor
35	Cam switch	72	Reel block
36	Loading motor	73	Main brake spring
37	Master cam	74	Dew sensor

LOCATION OF MECHANICAL PARTS

• TOP VIEW



• BOTTOM VIEW









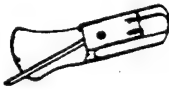


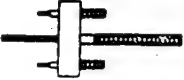

ADJUSTMENT, REPLACEMENT, ASSEMBLY AND CLEANING OF MECHANICAL UNITS

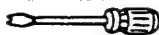


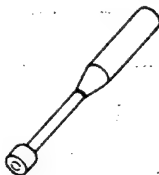


Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly or replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original efficient condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-F18	BU		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up and supply reel and for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two Gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0 kg)	JiGSG2000	BS		
8	Hex Wrench (0.9 mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special Hexagon type screws.
	Hex Wrench (1.2 mm)	JiGHW0012	AE		
	Hex Wrench (1.5 mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		This tape is especially used for electrical fine adjustment.
10	Drum Replacing Jig	JiGDT-0001	BG		This is used for replacement of the VCR's upper drum.
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used for the tension gauge. Rotary Transformer Clearance Adjusting Jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRIVERH-4	AP		This Screwdriver is used for adjusting the guide roller height and X-position.
13	Tension Band and Plate Adjusting Jig	JiGDRIVER-6	BM		This Jig is used for adjusting the tension band and tension plate.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts; the specified torque is 5 kg.
15	Box Driver	JiGDRIVER110-7	AS		This Jig is used for height adjustment of the A/C head.
		JiGDRIVER110-4	AV		This Jig is used for height adjustment of the retaining guide.
16	Retaining Guide Height Adjusting Jig	JiGGH-F18	BU		This Jig is used for height adjustment of the retaining guide.
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

NOTE:

Current JiGMA0001 contains Master Plane (JiGMP0001) and Disk Height Adjusting Jig (JiGRH0001). Even though new Disk Height Adjusting Jig (JiGRH0002) covers greater height, this new Jig (JiGRH0002) can be used for current JiGRH0001, but current Jig (JiGRH0001) cannot be used as JiGRH0002. Master Plane (JiGMP0001) can be used with JiGRH0001 and JiGRH0002 as well.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained every	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Remarks
Guide roller ass'y		□	□	□	□	□	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller		□	□	□	□	□	
Supply impedance roller (inner)			□		□	□	Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange		□	□	□	□	□	Clean tape contact area with the specified cleaning liquid.
Retaining guide		□	□	□	□	□	
Slant pole		□	□	□	□	□	
Video head		□	○□	□	○□	○□	Clean tape contact area with the specified cleaning liquid.
Full-erase head		□	□	□	□	□	
A/C head		□	□	□	□	□	
Pinch roller		□	□	□	□	○□	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt			□		□		
Loading belt			□		○		
Capstan loading belt			□		○		
Reel block*					○		
Tension band ass'y						○	
*See the table below for servicing the reel block parts.							
Supply/take-up reel disks			□ △		□△○		Clean with pure high quality isopropyl alcohol.
Video search brake lever					○		
Idler gear ass'y					○		
Main supply/take-up brake levers					○		

NOTE: ○: Part replacement.
 □: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
 △: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

This model has no adjusting parts for torques, tension, etc. If the reading is outside the specified range, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

Notes:

1. During removal and reassembly, be careful not to strike the nearby guide pin, drum, etc.
2. Before removal or reassembly, be sure to unplug the recorder from the AC outlet.
3. When removing and attaching the cassette loading belt, be careful to keep it free from grease.

• Removal

1. Put the unit in the cassette eject position.
2. Remove the cassette loading belt ①.
3. Disconnect the FFC (Full Flat Cable) ② at the right side of the cassette housing control assembly.

Note: Be careful not to break the FFC.

4. Remove the two cassette housing installation screws.
5. Move the cassette housing control assembly (Fig. 1-1) in the direction of arrow ⇒ ③, and pull it out straight upward.

• Reassembly

1. Insert the tabs of the cassette housing control assembly into the mechanism chassis, move it in the direction of arrow ⇒ ④, and secure temporarily.
Check to see if the cassette housing control assembly is in the correct position, and then tighten the two screws (XHP5330P06WS0).
2. Attach the cassette loading belt ①.
3. Connect the FFC ② at the right side of the cassette housing control assembly.

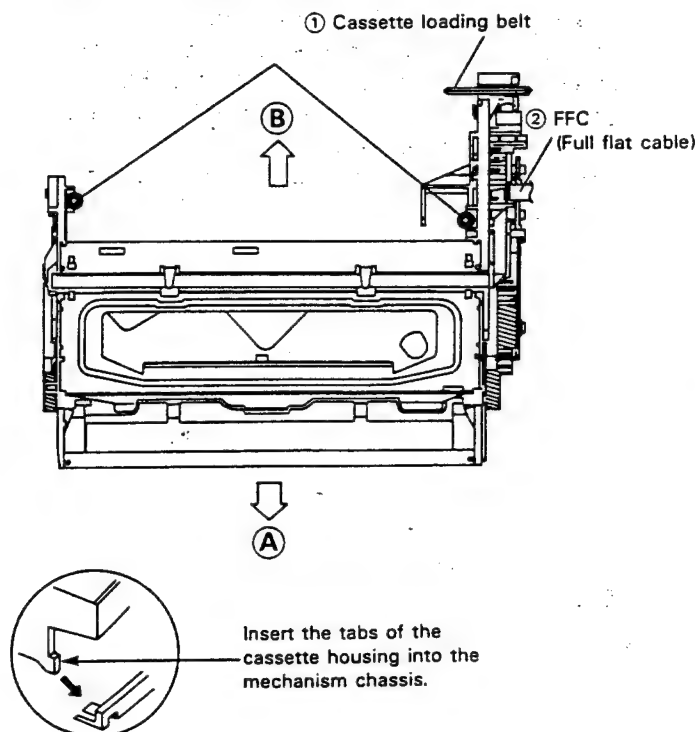


Figure 1-1.

REPLACEMENT OF WORM WHEEL ASSEMBLY

• Removal (Fig. 1 - 2)

1. Unsolder the cassette switch connector from the start sensor PWB ①.
2. Release the two catches ④ on the cassette housing frame (R), and remove the PWB.
3. Unscrew one B tight screw ② to detach the worm bracket ③.

Note: The bearing ④ can come off position too. So be careful not to let the bearing fall.

4. Remove the worm shaft assembly ⑤, pulley ⑥ and cassette loading belt ⑦ all from the cassette housing frame (R).
5. Finally pull the worm wheel assembly out of the boss of the cassette housing frame (R).

• Reassembly (Fig. 1-2)

1. Turn the phase gear ⑧ clockwise until the slider comes to a halt in the cassette insertion direction.
2. Set up the worm wheel gear assembly onto the boss on the cassette housing frame (R), matching the mark ⑨ on the phase gear ⑧ with the mark ⑩ on the worm wheel gear.

Note: Make sure that the slider pin is in the groove of the drive gear arm.

3. Install the pulley ⑥ and apply the cassette loading belt ⑦ both on the worm shaft assembly ⑤. Couple the clutch ⑪ to the clutch lever ⑨. And mount them together in the cassette housing frame (R).
4. Attach the worm bracket ③ to the worm shaft assembly ⑤. Place them onto the boss on the cassette housing frame (R).
5. Tighten one B tight screw ②.

Note: Make sure that the parts ③ and ④ of the cassette housing frame (R) are properly engaged with the parts ⑤ and ⑥ of the worm bracket ③.

6. Hook the start sensor PWB ① on the two positions ④ on the cassette housing frame (R).
Note: Check that the switch connector is right in the cassette switch mounting hole ④.
7. Finally resolder the cassette switch connector to the start sensor PWB.

Notes:

1. Do not overtighten the B tight screw (no more than 5.0 ± 0.5 kg. cm), because otherwise the lower threads of the screw hole at the resin-made boss may be broken.
2. Keep in mind that the clutch switching lever should be in the correct positional relation. The mechanism might malfunction even if the lever comes slightly out of position.

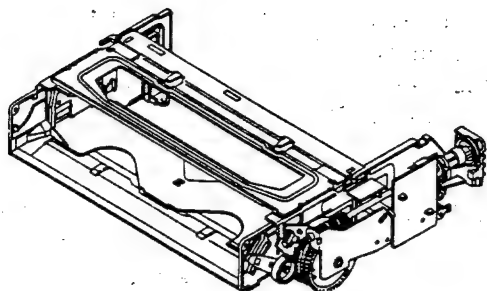


Figure 1-2 (a).

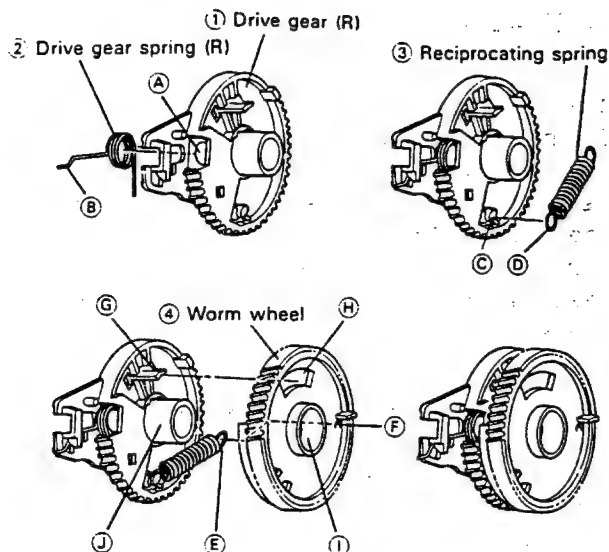


Figure 1-3.

REPLACEMENT OF CASSETTE LOADING BELT

• Replacement (Fig. 1-4)

1. Remove the start sensor PWB and worm bracket from the cassette housing frame (R).
2. Remove the worm shaft assembly, pulley and cassette loading belt from the cassette housing frame (R).
3. Replace the cassette loading belt with a new one.

Notes:

1. Do not overtighten the B tight screw which holds the worm bracket in position. The specified tightening torque is $5.0 \pm 0.5 \text{ kg} \cdot \text{cm}$.
2. Make sure that the cassette loading belt, being applied in the cassette housing frame (R), is free from grease. If stained with grease, clean the belt with the specific cleaning liquid.
3. Finally check the clutch switching lever for its specified points.

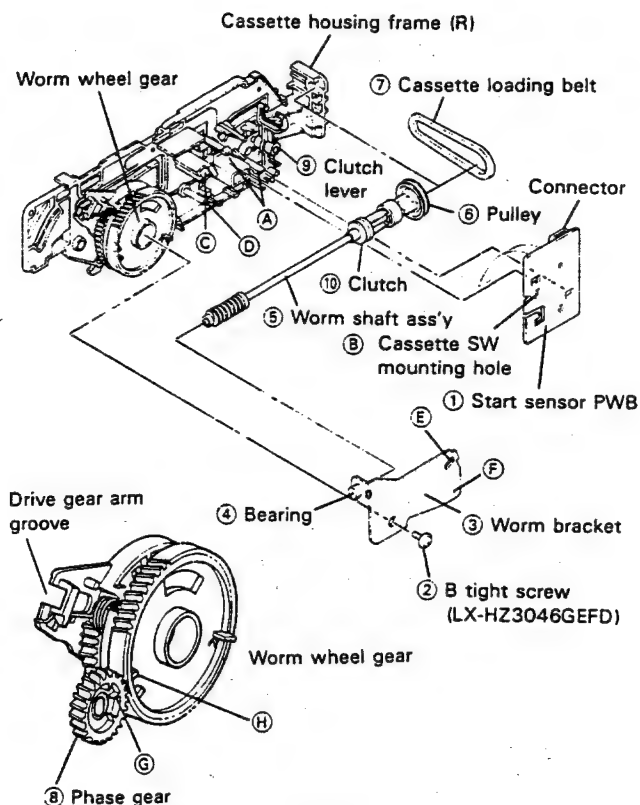


Figure 1-2 (b).

• Reassembly of drive gear (Fig.1- 3)

1. Pass the tip (B) of the drive gear spring (R) (2) through the square hole (A) of the drive gear (R) (1) to the hook the spring in position.
2. Hook one end (D) of the reciprocating spring (3) to the catch (C) of the drive gear (R) (1).
3. Hook the other end (E) of the reciprocating spring (3) to the catch (F) of the worm wheel (4).
4. Fit the drive gear (R) (1) to the worm wheel (4) so that the catch (G) and boss (J) on the drive gear (R) are exactly in the square hole (H) and round hole (I), respectively, in the worm wheel.

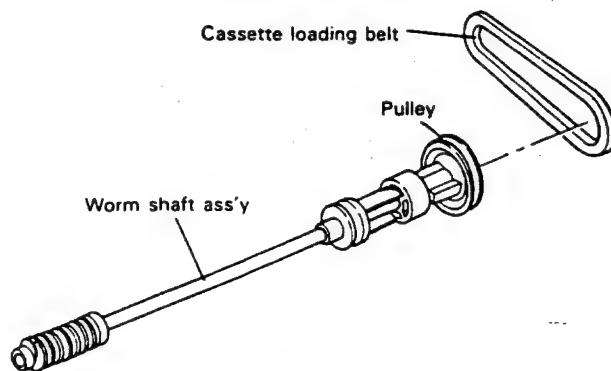


Figure 1-4.

CHECKING THE CLUTCH SWITCHING LEVER

• Checking (Fig. 1-5)

When removing and attaching the clutch switching lever from and to the mechanism chassis, check to see if the lever is in the position as shown below. If out of this position, malfunction might result.

1. First make sure that the rib **A** of the drive gear (R) **①** and the tip **B** of the switch lever **②** are in their correct positions.
2. Check also that the rib **C** of the cassette housing frame (R) and the catch **D** of the clutch lock lever **③** are in their proper positions.
3. Finally be sure that the positional relations between the clutch lever **④** and the clutch **⑤**, as well as between the clutch **⑤** and the pulley **⑥**, are as specified.

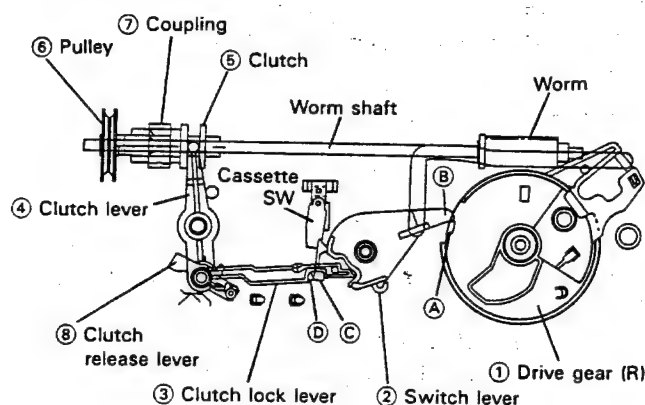


Figure 1-5.

• Resetting (Fig. 1-6)

Take the following steps to reset the clutch **⑤** if it is unlocked or if the switch lever **②** and clutch lock lever **③** are unlocked.

1. Turn the coupling **⑦** clockwise (as viewed from the front of the set) until the slider comes to the position indicated below.

Note: Notice that the slider is equipped with a lock mechanism. Unlock the slider, therefore, before shifting the slider.

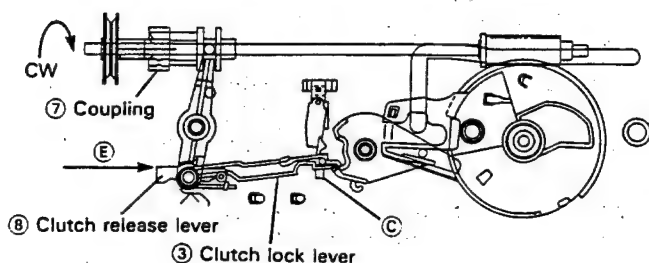


Figure 1-6.

2. Now push the clutch release lever **B** in the direction of arrow **E** by hand until the clutch lock lever **③** becomes tightly locked by the part **C** of the cassette housing frame (R).
 3. Then turn the coupling **⑦** counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.
- Note:** There is no need to lock the slider. Just keep shifting the slider.

REPLACEMENT OF LOCK RELEASE LEVER

• Removal (Fig. 1-7)

1. Turn the coupling clockwise until the slider **①** comes to the cassette down position.
- Note:** Before shifting, unlock the slider.
2. Slightly widen the cassette housing frames (R) and (L) to unhook the parts **A** of the slider holders (R) and (L) off the grooves of the above frames.
 3. Press the catch **B** on the slider holder (R) **②**, and let the slider **①** go off this holder in the direction of arrow **C**.
 4. Take the lock release lever ass'y **③** out of the slider holder (R) **②**.

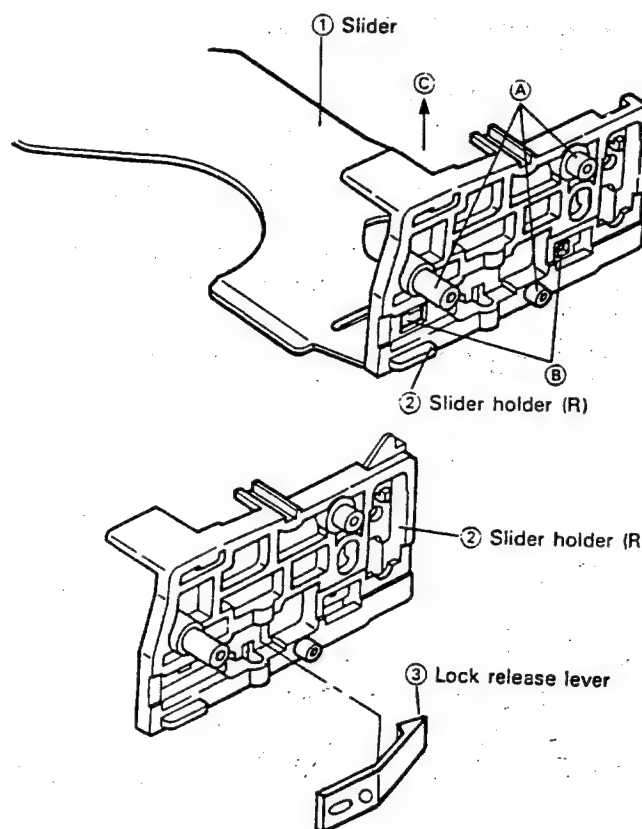


Figure 1-7.

● Reassembly (Fig. 1-7)

1. Attach the lock release lever ass'y ③ to the slider holder (R) ②.
2. Fit the slider holder (R) ② to the slider ①.
3. Slightly widen the cassette housing frames (R) and (L), and set the parts ④ of the slider holders (R) and (L) to the grooves of the cassette housing frames (R) and (L).

Note: Make sure of the following fitting: Fitting between the parts ④ of the slider holders (R) and (L) and the grooves of the cassette housing frames (R) and (L), as well as between the drive gear arms and the slider holders (R) and (L).

4. Turn the coupling counterclockwise until the slider ① comes to the cassette insertion opening.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Open the lid of a cassette tape by hand and hold it with a piece of vinyl tape.
2. Set the cassette tape in the tape mechanism. Then, stabilize the cassette tape with a weight (500g or less).

Note: The weight should not be more than 500g.

REMOVAL AND HEIGHT ADJUSTMENT OF REEL DISKS

● Removal of supply reel disk:

1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Remove the tension band ⑧.
4. Unscrew the screw ⑩ and release the cassette housing control ground spring ⑫ off the reel disk catch ①.
5. Release the supply reel disk catch ① and back tension lever ②. Pull out the supply reel disk ③ upward.

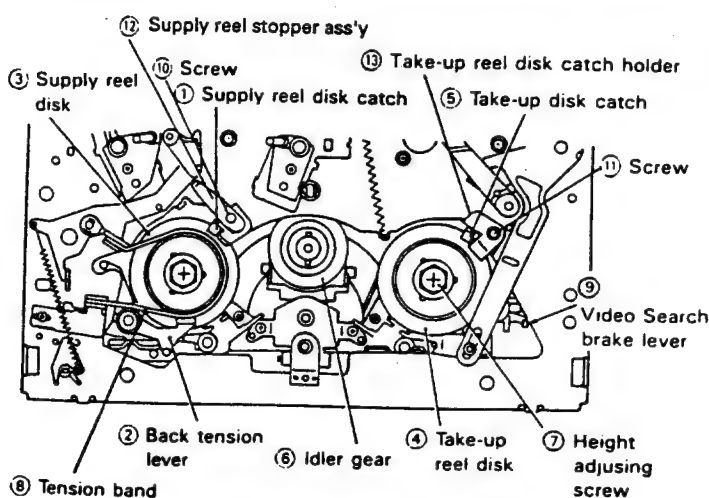


Figure 1-8.

● Removal of take-up reel disk:

1. Remove the cassette housing control assembly.

2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Unscrew the screw ⑪ and release the take-up reel disk catch holder ④ off the reel disk catch ⑤.
4. Release the take-up reel disk catch ⑤. Pull out the take-up reel disk ④ upward.

Notes:

1. After replacing either of the reel disks, be sure to perform the height adjustment procedure.
2. Take care not to deform the tension hand.
3. Be careful not to deform the back tension lever, main supply / take - up brake levers, video search brake lever and auxiliary fast forward brake. (See pages 4 and 5.)
4. Check the tension pole position. (See pages 15.)
5. Be careful not to damage the supply reel disk, take-up reel disk and idler gear ⑥.
6. Whenever replacing, clean and lubricate the reel disk shaft.

● Reassembly of supply reel disk:

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it, then install a new supply reel disk onto the shaft.
2. Replace the cassette housing control ground spring ⑫ in position and tighten up the screw ⑩.
3. Replace the tension band ⑧.
4. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

● Reassembly of take-up reel disk:

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it. Then, release the video search brake lever and install a new take - up reel disk onto the shaft.
2. Replace the take-up reel disk catch holder ④ in position and tighten up the screw ⑪.
3. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

Notes:

1. During removal and reassembly, be careful not to damage the reel disks, reel shafts, idler gear and brake levers.
2. After reassembly, check the back tension in video search rewind mode (see page 14) and checking the brake torque (see page 16)

HEIGHT ADJUSTMENT

1. Remove the cassette housing assembly, and place the master plane onto the mechanism unit as shown in Fig.1-9 (a), taking care not to hit the drum.
2. Ensure that the reel disk is lower than the part ④ but higher than the part ⑤ of Fig. 1-9 (b), by using the reel disk height adjusting jig. If the height is not correct, adjust the height adjusting screw.

Note: Whenever replacing the reel disk, perform the height adjustment.

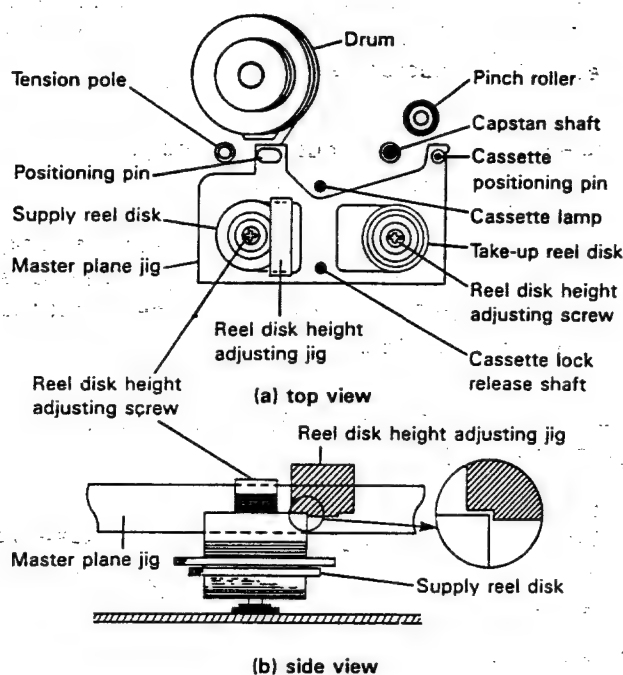


Figure 1-9.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST-FORWARD MODE

Notes:

1. When setting the torque gauge on the take-up reel disk and pushing the fast-forward button to start the reel disk turning, take care that the torque gauge does not fly off.
2. The checking and adjustment should be carried out without a video cassette tape in place.

• Checking

1. Remove the cassette housing assembly.
2. Place the torque gauge on the take-up reel disk and push the fast-forward button to place the unit in the fast-forward mode.
3. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction and check that it indicates 700 g.cm or more.

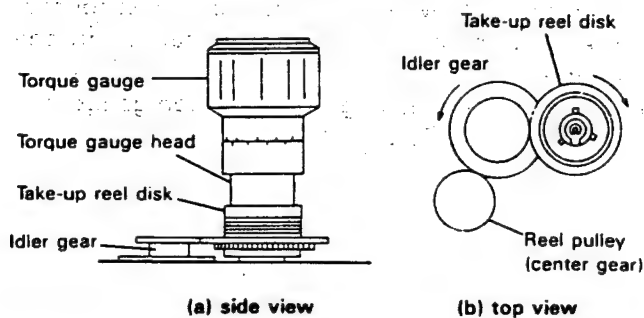


Figure 1-10.

• Adjustment

If the take-up torque is outside the specified range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.

If the take-up torque is still out of specification, replace the reel belt.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

Notes:

1. When setting the torque gauge on the supply reel disk and pushing the rewind button to start the reel disk turning, take care that the torque gauge does not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

• Checking

1. Remove the cassette housing assembly.
2. Place the torque gauge on the supply reel disk and push the rewind button to place the unit in the rewind mode.
3. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction and check that it indicates 700 g.cm or more.

• Adjustment

If the take-up torque is outside the specified range clean the capstan DD motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.

If the take-up torque is still out of specification, replace the reel belt.

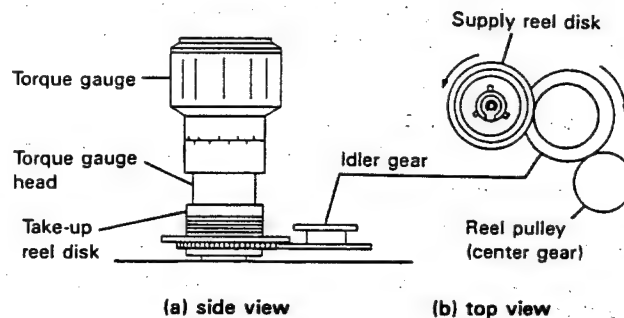


Figure 1-11.

CHECKING OF TAKE-UP TORQUE IN PLAY-BACK MODE

• Checking

Load a cassette torque meter (JiGVHT-063) into the unit and push the record button to place the unit in the record mode. Then check that the torque is as specified;

torque: 95 ± 30 g.cm

Note:

The measured torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in playback mode is outside the specified value, replace the take-up reel disk.
2. Push the record button to place the unit in the record mode, and check that the take-up torque is within the specified range.

CHECKING OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Checking**

Load a cassette torque meter (JiGVHT-O63) into the unit and push the play and video search rewind buttons to place unit in the video search rewind mode.

Then check that the torque is as specified;
torque in video search rewind mode : 170 ± 40 g.cm

Note:

The measured torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in video search rewind mode is outside the specified range, replace the supply reel disk.

CHECKING THE FAST FORWARD BACK TENSION

Note:

Set the torque gauge securely on the supply reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the fast forward button to place the unit in the fast forward mode.
3. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

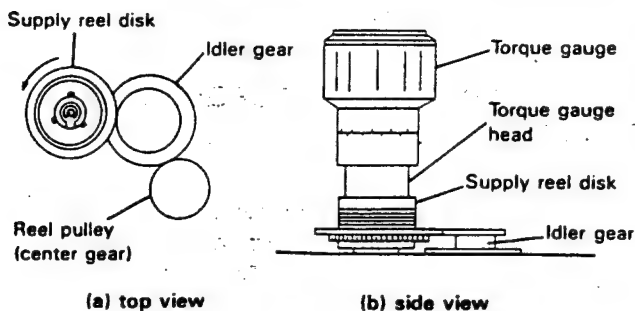


Figure 1-12.

CHECKING THE REWIND BACK TENSION

Note:

Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the rewind button to place the unit in the rewind mode.
3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

Note:

Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Push the video search rewind button to place the unit in the video search rewind mode.
4. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 40 ± 10 g.cm.

CHECKING THE PINCH ROLLER PRESSURE

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Hook the tension gauge adapter around the pinch roller shaft.
4. Using a tension gauge, pull the pinch roller in the direction of arrow \Rightarrow ① so that the pinch roller moves away from the capstan shaft.
5. Gradually release the pressure in the direction of arrow \Rightarrow ② to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
6. Check that the reading of the tension gauge is in the range of 1000 to 1200 gr.

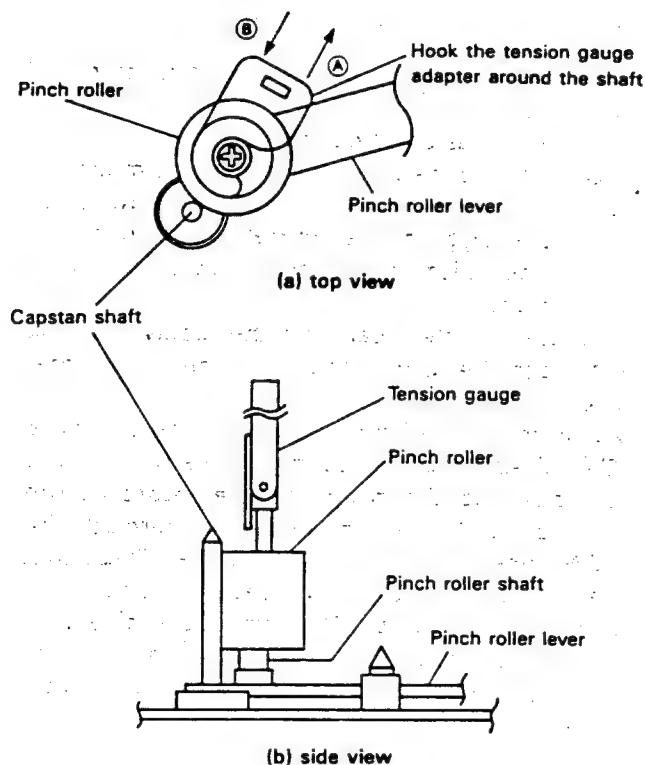


Figure 1-13.

ADJUSTMENT OF TENSION POLE

• Position checking (Fig. 1-14)

1. Remove the cassette housing assembly.
2. Set a video cassette tape and push the record button to place the unit in the record mode.
3. The pole bases (see page 4; item 19 and 27.) operate to bring the tape outside the cassette housing and simultaneously the tension pole moves to the left, loading the tape. At that time (loading mode), check the position of the tension pole.

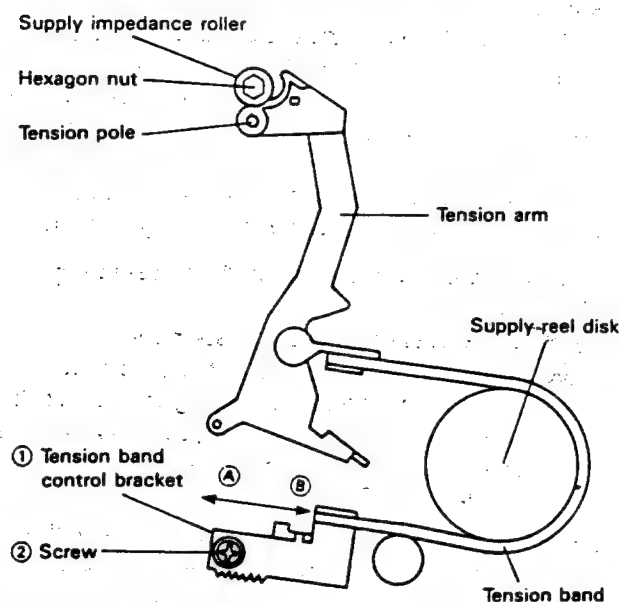


Figure 1-14.

4. At the top of the tape (E-180), check that the tension pole's center is aligned with the supply impedance roller's center.
5. Check that the tape is neither curled against the flange of the supply impedance roller nor mounted over it.
6. During the video search rewind mode with no cassette tape in place, check the supply reel disk is free of the tension band.

• Position adjustment (Fig. 1-15)

1. If the tension pole is at the right of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ⇒ ②, and tighten the screw ③.
2. If the tension pole is at the left of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ⇒ ④, and tighten the screw ③.

ADJUSTMENT OF RECORD/PLAYBACK BACK TENSION

• Checking

1. Remove the cassette housing assembly.
2. Put a torque cassette meter into the unit.
3. Push the record button to place the unit in the record mode. Check that the reading of the cassette meter is 23 to 28 g.cm.
4. Make sure the video cassette tape is wound over the retaining guide.
5. Make sure that the tape is not slack nor damaged at both ends.

• Adjustment (Fig. 1-15)

1. If the back tension is lower than specified, move the tension spring hook plate ① in the direction of arrow ② so that the protuberance behind be tight in the hole.
2. If the back tension is higher than specified, move the tension spring hook plate ① in the direction of arrow ③ so that the protuberance behind be tight in the hole.

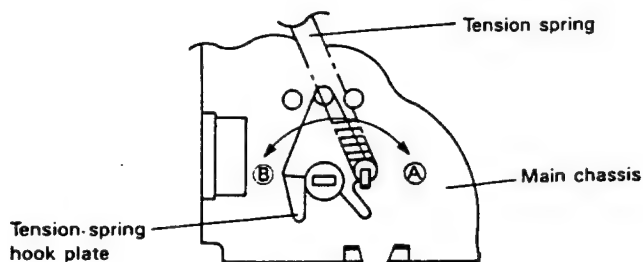


Figure 1-15.

Figure 1-16. Not used.

CHECKING THE BRAKE TORQUE

A) Checking the brake torque at the supply side.

• Checking

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.

Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward or rewind mode.

3. Separate the idler gear from the supply reel disk and place the torque gauge on the supply reel disk.
4. Slowly rotate the torque gauge in the clockwise (CW) direction of the supply brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the counterclockwise (CCW) direction of the supply brake. Check that the values are within the specified range (CW direction = 280 to 720 g.cm, CCW direction = 110 to 230 g.cm) and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

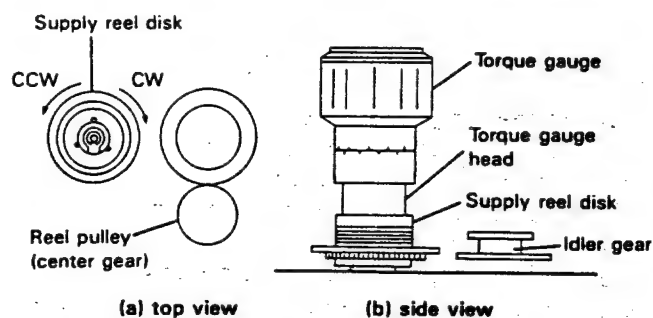


Figure 1-17.

• Adjustment

1. If the supply brake torque is outside the specified range (CW direction = 280 to 720 g.cm, CCW direction = 110 to 230 g.cm), clean the supply reel disk and brake lever felt, then recheck the torque.
2. If the supply brake torque is still outside the specified range, replace the main brake spring.

B) Checking the brake torque at the take-up side.

• Checking

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.

Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward to rewind mode.

3. Separate the idler gear from the take-up reel disk and place the torque gauge on the take-up reel disk.

- Slowly rotate the torque gauge in the CCW direction of the take-up brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the CW direction of the take-up brake. Check that the values are within the specified range (CCW direction = 280 to 720g.cm, CW direction = 90 to 200 g.cm) and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

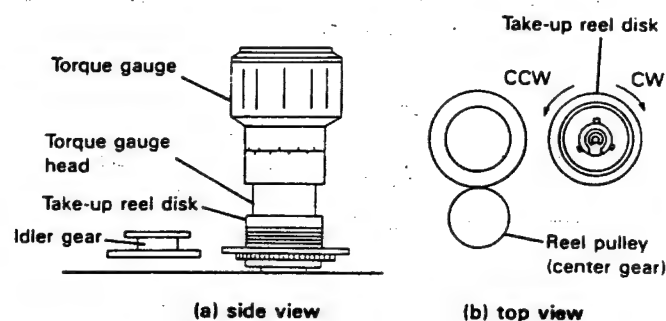


Figure 1-18.

• Adjustment

- If the take-up brake torque is outside the specified range (CCW direction = 280 to 720g.cm, CW direction = 90 to 200 g.cm), clean the take-up reel disk and brake lever felt, then recheck the torque.
- If the take-up brake torque is still outside the specified range, replace the main brake spring.

REPLACEMENT OF A/C (Audio/Control) HEAD

Note:

After replacement, perform the adjustment of tape drive train. Under any circumstances avoid touching the head (indicated by "⇒" in Fig. 1-20(c)).

•Replacement (See Figs. 1-19 and 1-20.)

- Loosen the tilt adjusting screw ⑥ by using Phillips screwdriver.
- Remove the azimuth adjusting screw ⑤ with a Phillips screwdriver.
- Remove the A/C head screw ④ with a Phillips screwdriver, paying attention to the spring ⑦ between the A/C head screw ④ and A/C head pedestal.

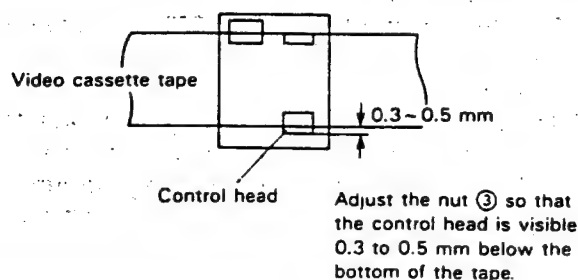


Figure 1-19.

- Remove the A/C head PWB ⑧ soldered to the A/C head assembly, and solder the A/C head PWB ⑧ onto a new A/C head assembly.
- The A/C head assembly ① is attached so that the A/C head arm ② and A/C head pedestal are roughly parallel to each other.

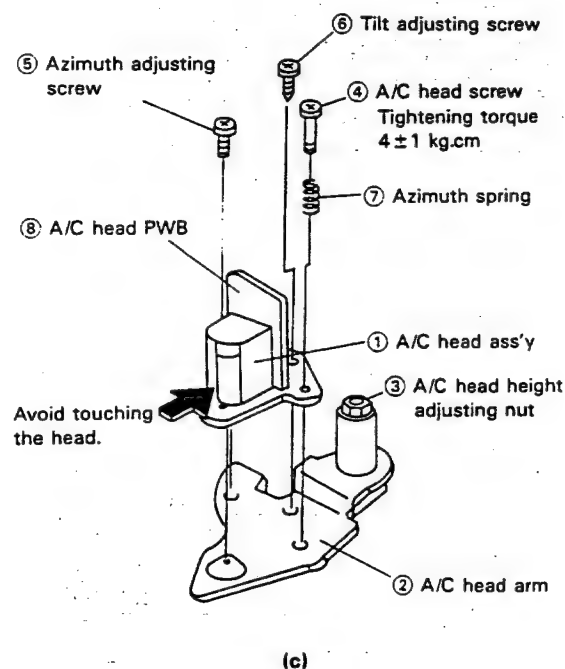
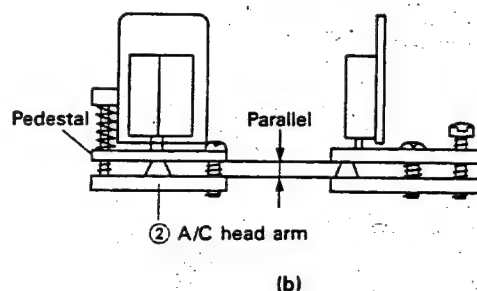
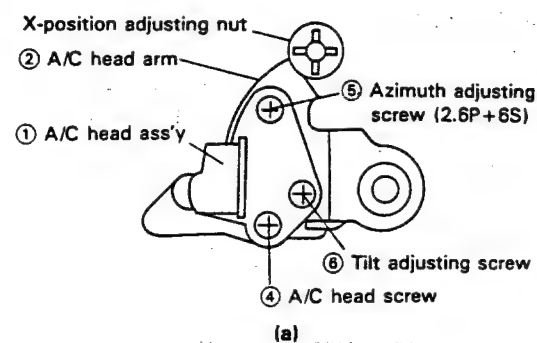


Figure 1-20.

6. Set the A/C head tilt angle according to Fig. 1-22.
7. Play an alignment tape and roughly adjust the height of the A/C head, visually, by turning the A/C head adjusting hexagon nut ③ with the box driver (JiGDRIVER110-7) until the tape comes to the position shown below. (See Fig. 1-19.)
8. Set the mechanism to the loading mode. Place the A/C head tilt adjusting jig on the main chassis as shown in Fig. 1-21. Slowly turn the tilt adjusting screw ⑥ with a Phillips screwdriver until there is no gap between the jig and the A/C head.

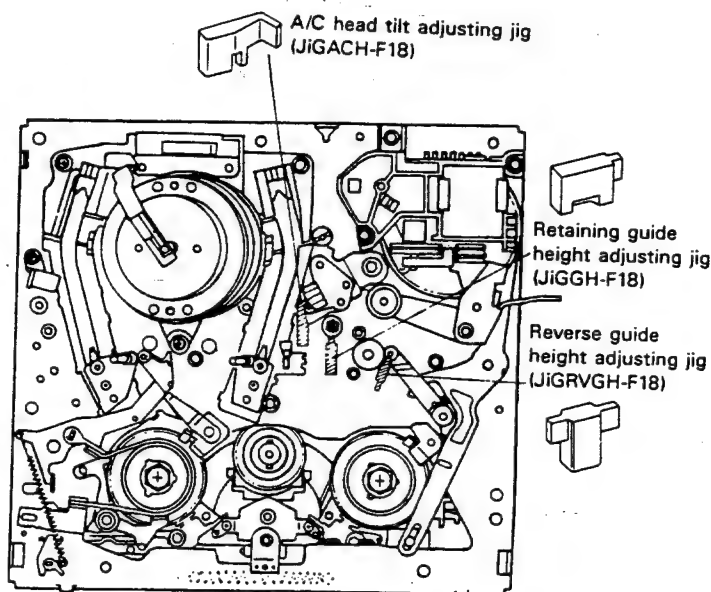


Figure 1-21.

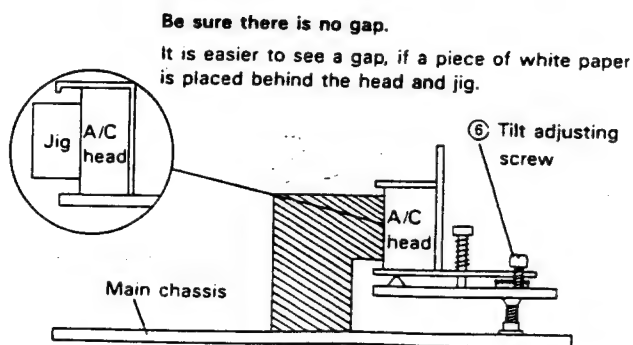


Figure 1-22.

HEIGHT ADJUSTMENT OF RETAINING GUIDE AND REVERSE GUIDE

• Adjustment

1. Before the rough adjustment of tape drive train, check that the retaining guide and reverse guide heights are within the specified values of Fig. 1-23, by using the special jigs.
2. If the retaining guide height is not correct, adjust the height with the box driver (JiGDRIVER110-4).
3. If the reverse guide height is not correct, use the height adjusting washers.

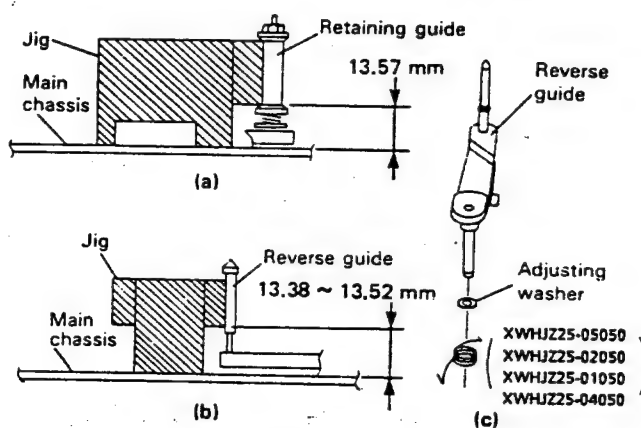


Figure 1-23.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Check and adjust the position of the tension pole and the back tension. (See pages 15)
 2. Set the tilt angle of the A/C head as shown in Fig. 1-22.
- Note:**
If the A/C head is adjusted, check and set the tilt angle as in the case of replacement.
3. When the above adjustments have been completed, roughly adjust the tape drive train using an alignment tape.
 - a. Connect the oscilloscope to the test points for PB chroma output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.

- b. Loosen the setscrew of the guide roller, and tighten it loosely by using the special bladed screwdriver (JiGDRIVERH-4) to such an extent that the guide roller turns smoothly.

- c. Set the alignment tape (VROCPSV) on the reel disk.

Note:

Attach a 400 to 500g. weight to the cassette tape when a cassette tape is placed on the reel disk with the cassette housing assembly removed.

- d. Place the unit to the playback mode.
 - e. Observe the waveform of the PB chroma, and push the (+) or (-) tracking button to check for a flat PB chroma. This adjustment is satisfactory if a flat response is obtained on the waveform of the PB chroma when the (+) or (-) tracking button is pushed. If a flat response cannot be obtained roughly adjust the guide roller using the special bladed screwdriver until the PB chroma output is flat.
While keeping the both (+) and (-) tracking buttons down, adjust the X-position adjusting nut so that the PB CHROMA envelope becomes almost maximum. In the case of rough adjustment, pay particular attention to the outlet side (see Fig. 1-24).
 - f. Adjust the retaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.
4. The A/C head height and azimuth are adjusted after rough adjustment of the tape drive train has been done.
 - a. Use the alignment tape and play back its audio 7kHz signal (monoscope pattern for video signal) and observe the audio output on an oscilloscope.
 - b. Adjust the azimuth adjusting screw so as to obtain the maximum audio output.
 - c. Use the alignment tape and play back its audio 1kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver so as to obtain the maximum audio output.
 - d. After the height adjustment, use the alignment tape and play back its audio 7kHz signal (monoscope pattern for video signal) again and adjust the azimuth adjusting screw so as to obtain the maximum audio output. After this adjustment, apply glyptal to the screws and nuts to fix them.

5. The final adjustments of tape drive train and X-position are adjusted after adjustment of the A/C head has been completed.

- a. Connect the oscilloscope to the test points for PB chroma output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.
- b. Play back the tape drive train alignment tape (VROCPSV).
- c. Finely adjust the guide roller's height, observing the envelope on the oscilloscope. Push the (+) or (-) tracking button while adjusting the guide roller, in order to obtain an envelope waveform which is as flat as possible. If the tape is above or below the helical lead, the PB chroma waveform will take the shape shown in Fig. 1-26. Adjust for maximum flatness of the envelope according to the figure.

Note:

Adjustment is made for CH-1 of switching pulse (low level). The broken lines indicate the envelope waveform when the tape does not run properly.

Push the (+) or (-) tracking button to check the envelope waveform.

After adjustment, tighten the setscrew of the guide roller firmly.

Play back the alignment tape (VROCPSV) again in the unloading mode, and make sure that there is no change in the PB chroma output.

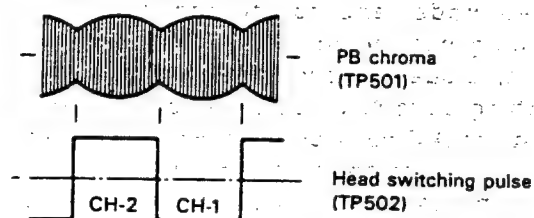


Figure 1-24.

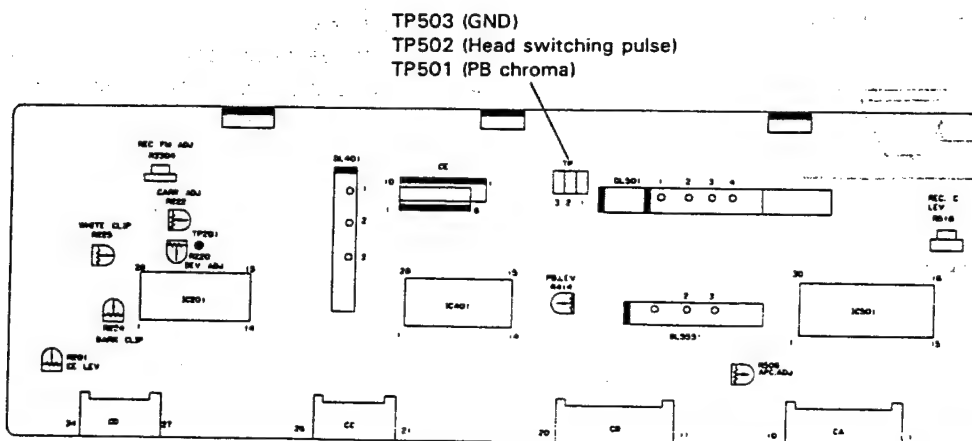


Figure 1-25.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to have the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to have the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-26.

d. Adjust the retaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.

e. The X-position is adjusted after tape drive train adjustment.

Push the (+) and (-) tracking buttons at the same time to set the tracking buttons to the preset mode, and rotate the X-position adjusting nut shown in Fig. 1-27 with the special bladed screwdriver for maximum switching pulse low side envelope, and then adjust the A/C head position. Now adjust the play back switching point to $6.5 \pm 0.5H$. Check the flatness of envelope and sound by selfrecording.

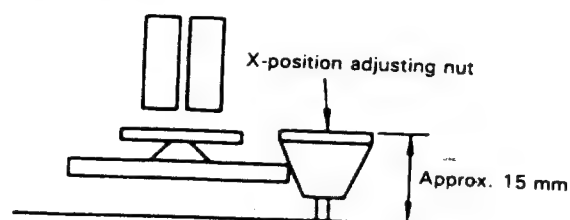
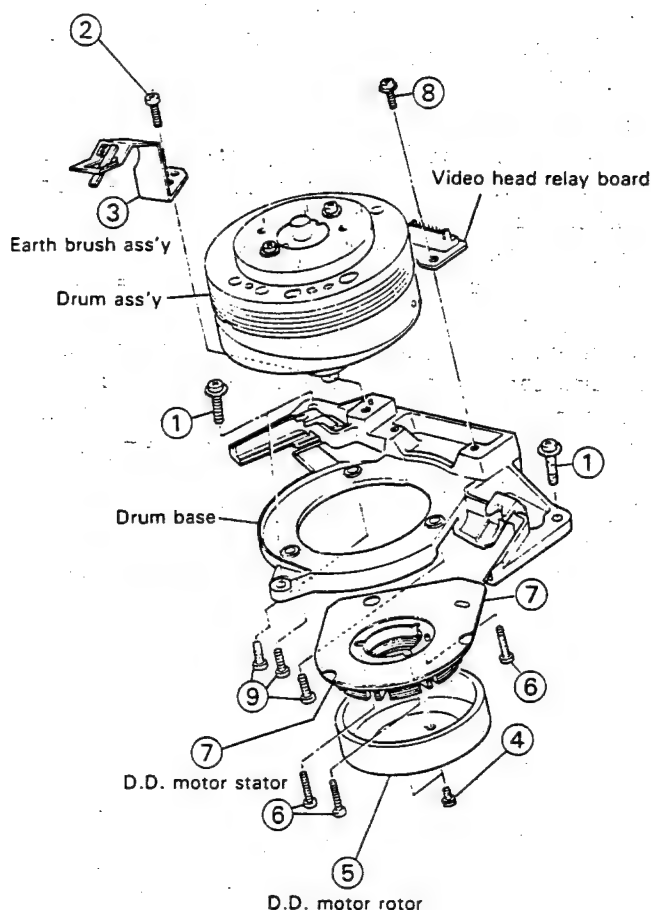


Figure 1-27.

REPLACEMENT OF DRUM ASSEMBLY

• Removal

1. Remove the head amp. PWB from the video head relay board.
2. Remove the bottom board (Ref. No ④ in the Cabinet Parts Diagram).
3. Remove the D.D. drum motor connector (ME).
4. Loosen the Drum-base mounting screws ① and remove the drum ass'y from the mechanism chassis.
5. Loosen the Earth brush ass'y mounting screw ② and remove the Earth brush ass'y ③.
6. Loosen the two D.D. motor rotor mounting screws ④ and remove the D.D. motor rotor ⑤.
7. Loosen the three D.D. motor stator mounting screws ⑥ and remove the stator ⑦.
8. Remove the two video head relay board mounting screws ⑧.
9. Loosen the three drum ass'y mounting screws ⑨ and remove the drum ass'y from the Drum-base.

**Note:**

Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum match.

Figure 1-28.

REPLACEMENT OF D.D. (DIRECT DRIVE) MOTOR

Note:

Put the unit in the cassette eject position.

• Removal

1. Remove the six screws from the bottom panel and remove the bottom panel.
2. Disconnect the drum D.D. motor lead connector.
3. Remove the two screws ① which hold the D.D. rotor assembly in place, using a Phillips screwdriver.
4. Remove the D.D. rotor assembly.
5. Remove the three screws ② which hold the D.D. stator assembly in place, using a Phillips screwdriver.
6. Remove the D.D. stator assembly.

• Reassembly

1. Place the D.D. stator assembly on top of the lower drum.
2. Secure the D.D. stator with the three screws ② using a Phillips screwdriver.

Note:

Be careful not to scratch the core, windings or Hall device.

3. Install the D.D. rotor assembly onto the drum shaft.

Note:

Install the assembly directly onto the direction of the shaft. (Refer to Fig. 1-29 for the installation direction.)

4. Secure the D.D. rotor assembly with the screws ①.
5. Connect the drum D.D. motor lead connector.
6. Install the bottom panel with six screws.

Note:

Be careful not to damage the upper drum or the video head.

7. After replacement of the D.D. motor as shown above, proceed with the adjustment of the playback switching point.

Notes:

1. Be careful not to damage the upper drum or the video head.
2. Be sure that the Hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.

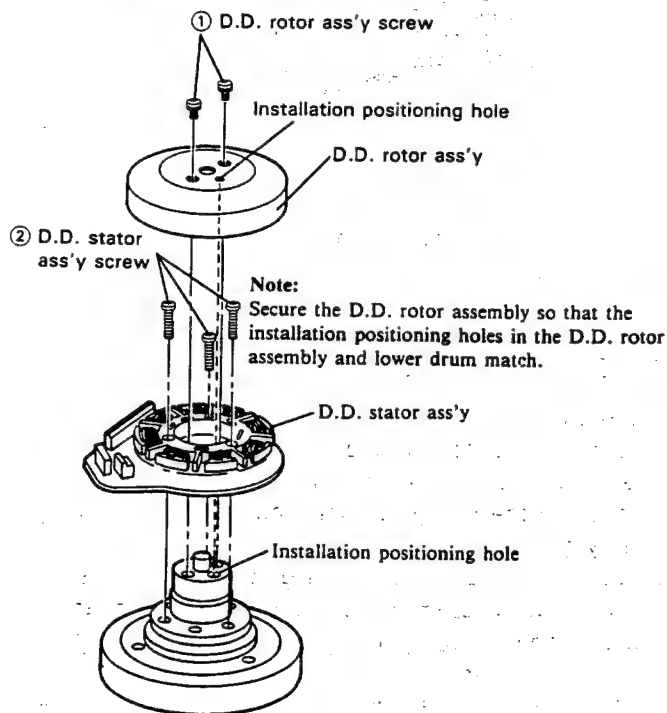


Figure 1-29.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

• Removal

1. Remove the FFC ① from the capstan D.D. motor control PWB ②.
2. Remove the three screws ③, and remove the capstan D.D. motor ④ from the main chassis.

• Reassembly

1. Mount the capstan motor on the main chassis while making sure not to allow the capstan shaft to hit the main chassis, and attach it with the three screws ③.
2. Insert the FFC ① into the capstan D.D. motor control PWB ②.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan motor and check the movement.
2. Check and adjust the servo circuit.

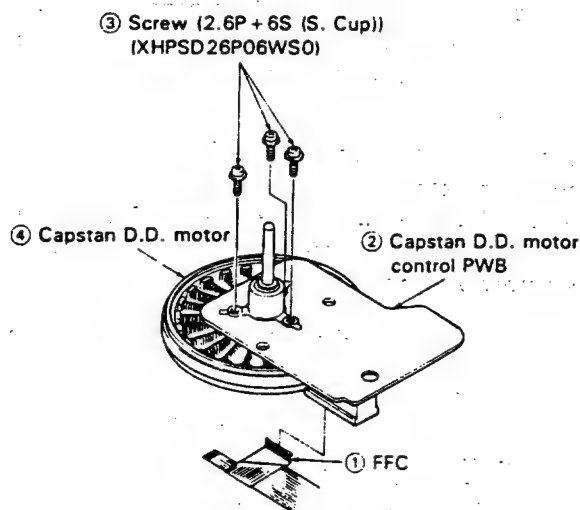


Figure 1-30.

REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

• Removal

1. Remove the slow brake spring ①, slow brake lever ② and slow brake cap ⑪.
2. Take out the E ring ⑧ first and then the loading relay gear ③.
3. Rotate the take-up loading gear ④, take-up loading arm assembly ⑤, supply loading gear ⑥ and supply loading arm assembly ⑦ slightly in the loading direction, and take them all out.
4. Finally remove the E ring ⑧ and relay gear drive lever ⑧.

• Reassembly

1. Take the reverse steps of the removal.
2. In reassembling, match the tally marks on the gears, as shown in Fig. 1-31

Note:

1. When reassembling, apply grease to the following points; all the gear teeth, all the gear shafts, and the cam groove of loading relay gear which the relay gear drive lever pin comes in.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful not to stain the felt of the slow brake.
4. Be also careful to keep the outer surface of the capstan D.D. motor ⑨ free from dust and dirt. (If stained, the MR (Magnet Resistor) element ⑩ might be damaged.)
5. Reshape the anti-fall hooks of the slow brake, supply/take-up loading gears as required. Avoid reshaping too much. Do not forget to place the slow brake cap in position.

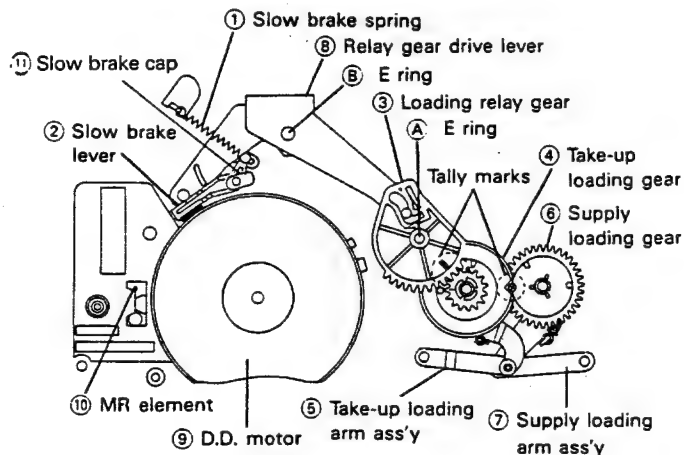


Figure 1-31.

REMOVAL AND REASSEMBLY OF LOADING BLOCK

• Removal

1. Remove the leads and the cassette loading belt from the loading block.
2. Unscrew the three screws ③, and pull up and remove the loading block.

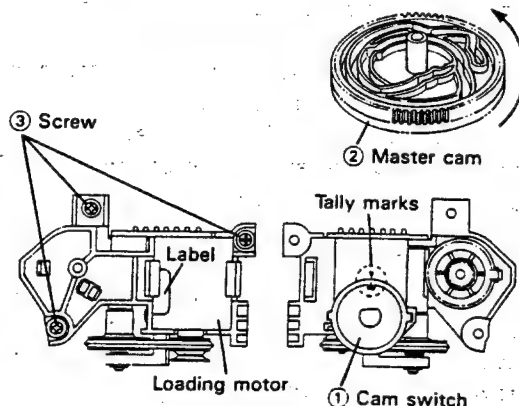


Figure 1-32.

• Reassembly

1. Turn the master cam ② all the way counter-clockwise.
2. Match the tally mark on the cam switch ① with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.
3. Finally connect the leads and apply the cassette loading belt.

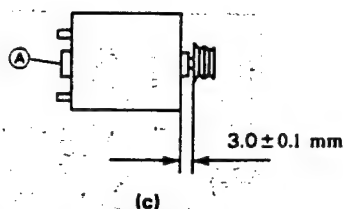
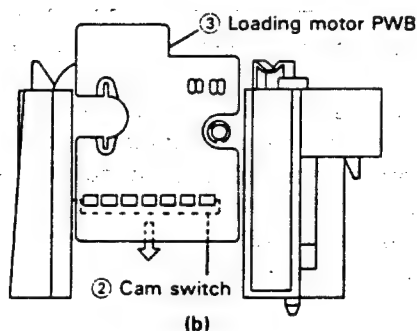
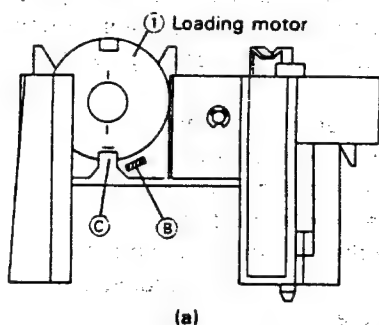
Notes:

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up.

REPLACEMENT OF LOADING MOTOR

• Removal

1. Remove the loading block.
2. Undo the loading belt.
3. Unsolder the leads from the loading motor ①.
4. Unlock the left and right catches of the cam switch ② off the loading block PWB ③. Take out the loading block PWB ③.



Note:

1. Press-fit the loading motor pulley to the dimension specified in Fig. 1-33(c).
2. Keep the pressure on the part (A) (see above) less than 5 kg.

Figure 1-33.

5. Put the tip of a bladed screwdriver or the like into the opening ⑤ shown in Fig. 1-33 (a). Pry up the back end of the loading motor ① and take out the motor.

• Reassembly

1. Place the loading motor so that its label is visible as shown in Fig. 1-32.

Note:

Make sure that the screw hole at the motor shaft and the protuberance on the loading block are properly engaged and that the notch at the loading motor end and the part ⑥ of the loading block are also fitted together.

2. Set up the loading block PWB ③ and the cam switch ② in position.
3. Resolder the leads to the loading motor.
4. Finally place the loading block in position.

REPLACEMENT OF MASTER CAM

• Removal

1. Remove the loading block.
 2. Remove the E ring ① and then the half-loading reciprocating lever ①.
- Note:
- There is no need to take out the half-loading drive lever.
3. Remove the E ring ② first and then the pinch roller lever ②.
 4. Finally pull out the master cam ③ upward.

• Reassembly

1. Place the relay gear drive lever in the unloading state as shown in Fig. 1-31.
 2. Set the relay shifter lever ④ to the main chassis; the shifter lever should be adjusted to the reverse guide spring hole in the main chassis. Then place the master cam so that the cut-off part of the boss ⑤ should face the direction of arrow ⇒ ⑤.
 3. Place the half-loading reciprocating lever ① so that its cam follower comes in the outermost cam groove. Now attach the E ring ①.
- Note:
- Preferably hook the half-loading reciprocating spring ⑤ before attaching the lever. It is easier to set up.
4. Turn the master cam ③ somewhat clockwise until the pinch roller lever's cam follower comes into the master cam's groove ⑥. Then attach the E ring ②.
 5. Rotate the master cam ③ by hand to make sure all the four levers (relay gear drive lever, relay shifter lever, half-loading reciprocating lever and pinch roller lever) are right in the cam grooves.
 6. Finally set up the loading block.

Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. Before placing the loading block, be sure to rotate the master cam by hand to make sure the levers are right in their respective positions. Otherwise the master cam and the levers might get damaged when the motor starts.
3. Apply grease to the master cam's grooves and teeth.

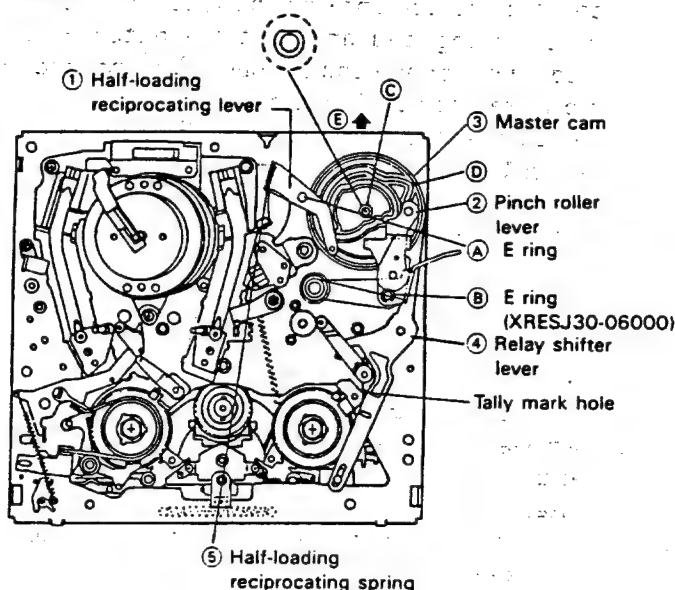


Figure 1-34.

HOW TO UNLOAD THE CASSETTE MANUALLY

1. To unload the cassette the common way.

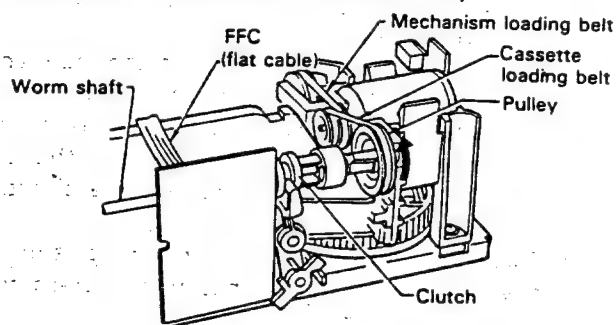


Figure 1-35.

- (1) Turn the pulley in the direction of arrow.
(By this, the clutch becomes engaged to eject the cassette.)

Notes:

- Do not touch the worm shaft. Just turn the pulley, and the worm shaft will rotate together.
- Carefully turn the pulley if the unit is equipped with the half-loading lever.
Otherwise the cassette tape may get loose.

- (2) To unload the cassette by activating the cassette housing control.

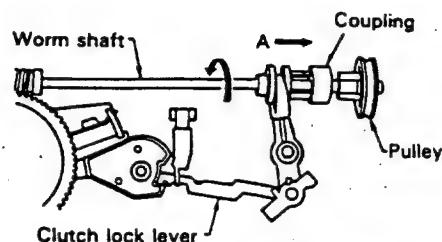


Figure 1-36.

- (1) Remove the cassette loading belt.
- (2) Turn the coupling in the direction of arrow until the cassette comes up.
- (3) Press the clutch in the direction A to get the clutch engaged.
- (4) Now turn the worm shaft all the way in the direction of arrow to take out the cassette.

Notes:

- Carefully turn the worm shaft if the unit is equipped with the half-loading lever.
Otherwise the cassette tape may become loose.
- If the second method (activating the cassette housing control) is carried out, the cassette housing control and the mechanism come out of phase from each other. Take the following steps to get in phase with the cassette housing control.

- (1) Remove the cassette loading belt and the flat cable.
- (2) Turn the power on. The mechanism will automatically be in the eject mode and get in phase with the cassette housing control.
- (3) Unplug the power cord.
- (4) Make sure the cassette housing stays in the eject mode. Apply the cassette loading belt and connect the flat cable.
- (5) Plug in the power cord. Finally load the cassette and eject it to make sure the motion is perfect.
(This loading and ejection makes for proper phasing.)
- If the tape has not been fully rewound, remove the bottom panel of the unit and turn the capstan D.D. motor rotor or the reel pulley in the direction of arrow B to wind up the tape.
Now you can take out the cassette without damaging the tape.
- Before taking the above measure, be sure to unplug the power cord.

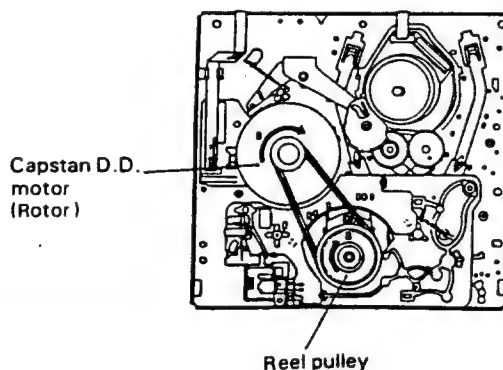


Figure 1-37.

ADJUSTMENT OF ELECTRICAL CIRCUITRY

Prior to the adjustment:

In most cases, necessity for electrical circuits will arise from replacement of mechanical parts including the video head. Before starting adjustment of electrical circuits, check that mechanical operation of the equipment is complete (the mechanism are adjusted completely).

If the equipment fails electrically, locate a defect or defects first of all using instruments. Then repair or replace parts and make adjustment by the procedures described below.

When required instruments are not available, do not move controls indiscriminately.

- Instruments

- Colour monitor TV
- DC regulated power supply
- VTVM
- Oscilloscope
- Audio generator
- Colour bar generator
- Alignment tape
- Frequency counter
- Blank video tape(VHS)

ADJUSTMENT OF MAIN (SERVO, SYSTEM CONTROL) CIRCUIT

- Test points layout

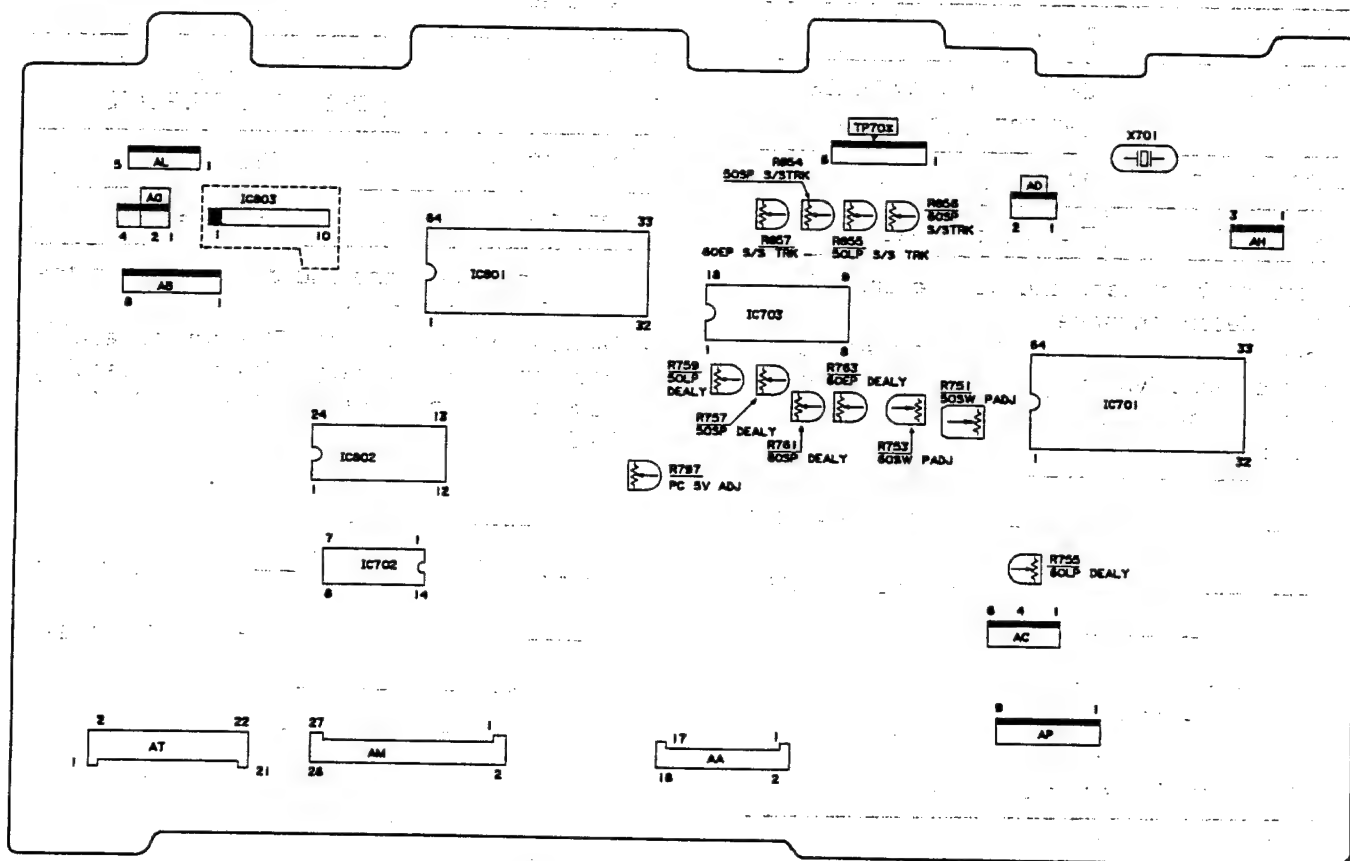


Figure 2-1. System Control, Servo PWB

ADJUSTMENT OF SERVO CIRCUIT

Adjustment of PC 5V power supply

Measuring instrument	VTVM
Mode	PAL System SP Recording
Test point	TP704
Adjusting point	R797 (PC 5V control)
Specification	$5.1 \pm 0.1V$

In the PAL System SP Recording mode, adjust R797 so that the voltage at TP704 be $5.1 \pm 0.1V$.

Precaution in adjusting the X position

Adjustment of PAL System SP Delay

Measuring instrument	Oscilloscope
Mode	PAL SP Recording
Tape used	Blank tape
Test point	CH1: TP701 H.SW.PULSE CH2: TP702 CTL PULSE
Adjusting point	R757 PAL SP Delay
Specification	$T = 30.2 \pm 1 \text{ msec.}$

1. Insert the blank tape and put the unit in the PAL SP Recording mode.
2. Make sure that the time "T" from the leading edge of head switching pulse to the leading edge of control pulse at TP702 (CTL PULSE) is $30.2 \pm 1 \text{ msec.}$

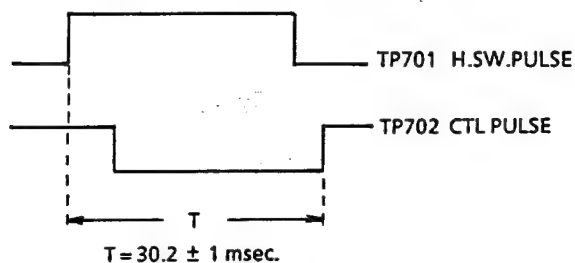


Figure 2-2.

Adjustment of PAL System LP Delay

Measuring instrument	Oscilloscope
Mode	PAL LP Recording
Tape used	Blank tape
Test point	CH1: TP701 H.SW.PULSE CH2: TP702 CTL PULSE
Adjusting point	R759 PAL LP Delay
Specification	$T = 18.4 \pm 1 \text{ msec.}$

1. Insert the blank tape and put the unit in the PAL LP Recording mode.
2. Make sure that the time "T" from the leading edge of head switching pulse to the leading edge of control pulse at TP702 (CTL PULSE) is $18.4 \pm 1 \text{ msec.}$

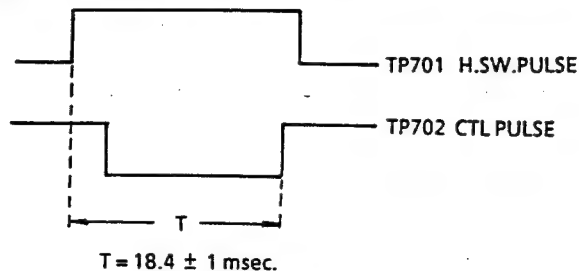


Figure 2-3.

Adjustment of NTSC System SP Delay

Measuring instrument	Oscilloscope
Mode	NTSC SP Recording
Tape used	Blank tape
Test point	CH1: TP701 H.SW.PULSE CH2: TP702 CTL PULSE
Adjusting point	R761 NTSC SP Delay
Specification	$T = 24.0 \pm 1 \text{ msec.}$

1. Insert the blank tape and put the unit in the NTSC SP Recording mode.
2. Make sure that the time "T" from the leading edge of head switching pulse to the leading edge of control pulse at TP702 (CTL PULSE) is $24.0 \pm 1 \text{ msec.}$

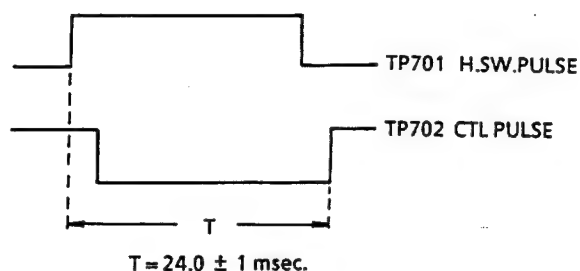


Figure 2-4.

Adjustment of NTSC System LP Delay

Measuring instrument	Oscilloscope
Mode	NTSC LP Recording
Tape used	Blank tape
Test point	CH1: TP701 H.SW.PULSE CH2: TP702 CTL PULSE
Adjusting point	R755 NTSC LP Delay
Specification	$T = 11.2 \pm 1 \text{ msec.}$

1. Insert the blank tape and put the unit in the NTSC LP Recording mode.
2. Make sure that the time "T" from the leading edge of head switching pulse to the leading edge of control pulse at TP702 (CTL PULSE) is $11.2 \pm 1 \text{ msec.}$

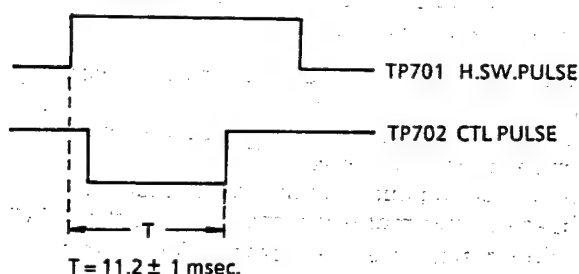


Figure 2-5.

Adjustment of NTSC System EP Delay

Measuring instrument	Oscilloscope
Mode	NTSC EP Recording
Tape used	Blank tape
Test point	CH1: TP701 H.SW.PULSE CH2: TP702 CTL PULSE
Adjusting point	R763 NTSC EP Delay
Specification	$T = 16.7 \pm 1 \text{ msec.}$

1. Insert the blank tape and put the unit in the NTSC EP Recording mode.
2. Make sure that the time "T" from the leading edge of head switching pulse to the leading edge of control pulse at TP702 (CTL PULSE) is $16.7 \pm 1 \text{ msec.}$

Now go to the X position adjustment.

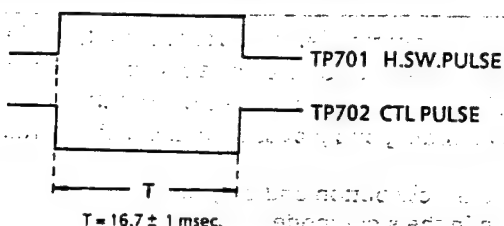


Figure 2-6.

Adjustment of PAL System playback switching point

Measuring instrument	Oscilloscope
Mode	Playback Tracking button at center
Tape used	Alignment tape (VROCPSV)
Test point	CH-1; TP701 CH-2; Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Adjusting point	R751 (PAL switching point control)
Specification	$6.5 \pm 0.5H$

1. Insert the PAL System alignment tape (VROCPSV) and put the unit in the playback mode.
2. Set the tracking button to the center position.
3. Adjust R751 (PAL switching point control) so that the waveform on the oscilloscope screen be as shown in Fig. 2-7.

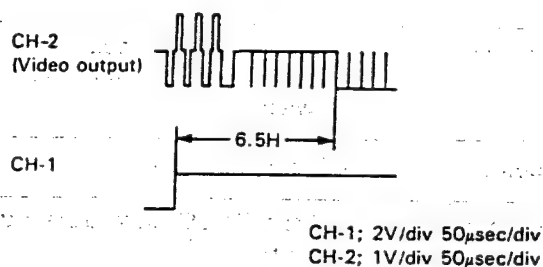


Figure 2-7.

Adjustment of NTSC System playback switching point

Measuring instrument	Oscilloscope
Mode	Playback Tracking button at center
Tape used	Alignment tape (VROATSV)
Test point	CH-1; TP701 CH-2; Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Adjusting point	R753 (NTSC switching point control)
Specification	$6.5 \pm 0.5H$

1. Insert the NTSC System alignment tape (VROATSV) and put the unit in the playback mode.
2. Set the tracking button to the center position.
3. Adjust R753 (NTSC switching point control) so that the waveform on the oscilloscope screen be as shown in Fig. 2-8.

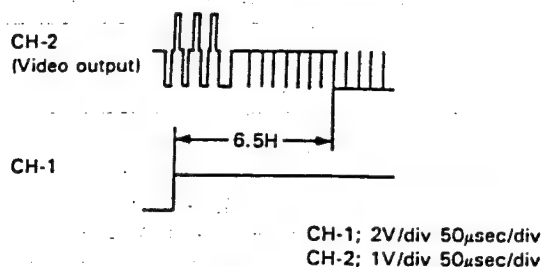


Figure 2-8.

Adjustment of NTSC System SP slow tracking

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Video signal (external input selector switch)
Test point	Monitor screen
Adjusting point	R856 (NTSC SP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Feed the video signal to the video input terminal (with the external input selector switch).
2. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.
4. Set the tracking button to the center position.
5. Observing the monitor screen, adjust the NTSC SP slow tracking preset control (R856) until the noise bar disappears from the screen.
6. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Now make sure there is no noise on the screen. (Repeat this step three times or so.)

Adjustment of PAL System LP slow tracking

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal (external input selector switch)
Test point	Monitor screen
Adjusting point	R855 (PAL LP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Receive a commercial broadcast signal, or Feed the video signal to the video input terminal (with the external input selector switch).
2. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.

Adjustment of PAL System SP slow tracking

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal (external input selector switch)
Test point	Monitor screen
Adjusting point	R854 (PAL SP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Receive a commercial broadcast signal, or feed the video signal to the video input terminal (with the external input selector switch).
2. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.
4. Set the tracking button to the center position.
5. Observing the monitor screen, adjust the PAL SP slow tracking preset control (R854) until the noise bar disappears from the screen.
6. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Now make sure there is no noise on the screen. (Repeat this step three times or so.)

4. Set the tracking button to the center position.
5. Observing the monitor screen, adjust the PAL LP slow tracking preset control (R855) until the noise bar disappears from the screen.
6. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Now make sure there is no noise on the screen. (Repeat this step three times or so.)

Adjustment of NTSC System EP Slow tracking

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Video signal (external input selector switch)
Test point	Monitor screen
Adjusting point	R857 (NTSC EP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Feed the video signal to the video input terminal (with the external input selector switch).
2. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.
4. Set the tracking button to the center position.
5. Observing the monitor screen, adjust the NTSC EP slow tracking preset control (R857) until the noise bar disappears from the screen.
6. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Now make sure there is no noise on the screen. (Repeat this step three times or so.)

Adjustment of still picture vertical sync (Performance check)

Measuring instrument	Monitor TV
Mode	Still picture playback
Tape used	Self-recording tape
Test point	Monitor screen
Adjusting point	R8110 (V-Lock control)
Specification	No vertical jitter

1. Play back the tape self-recorded in the LP mode.
2. Press the pause/still button to reproduce the recording in the still mode.
3. Observing the monitor screen, adjust the still picture V-Lock control (R8110) until the vertical jitter disappears from the screen.

Note; V-Lock control (R8110) is located in the operation PWB.

ADJUSTMENT OF MAIN, SUB CHROMA AND HEAD AMP CIRCUIT

• Test point layout

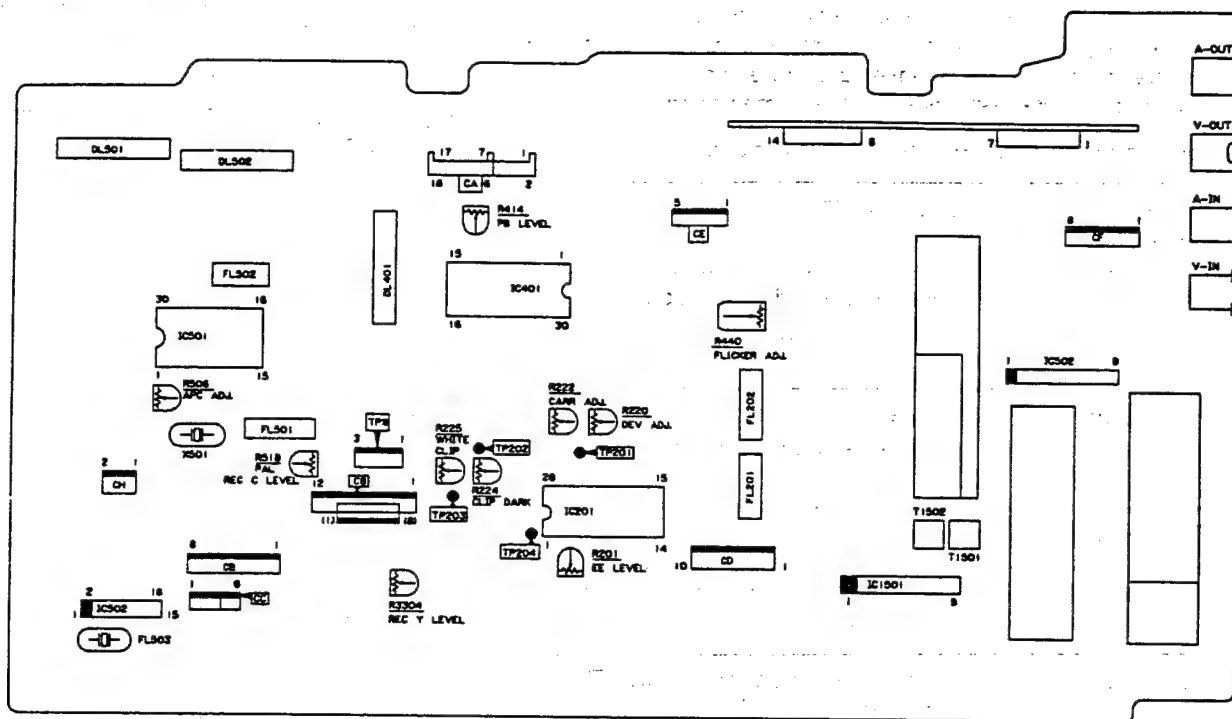


Figure 2-9. MAIN PWB

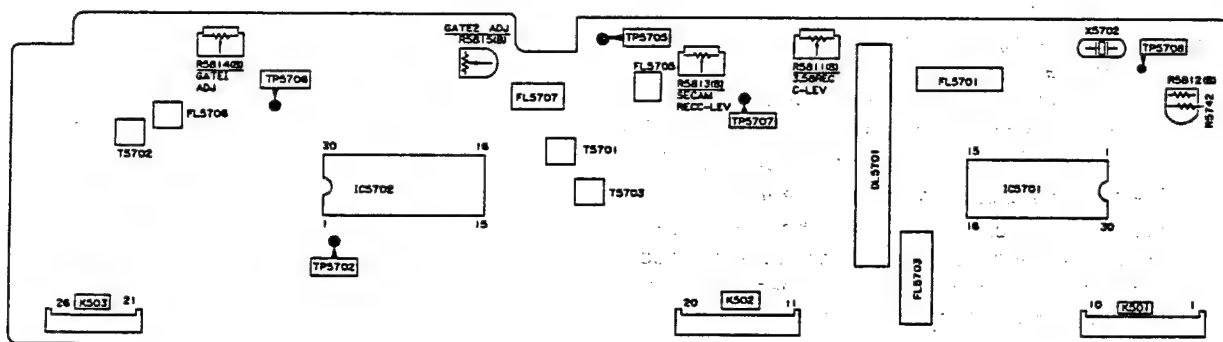


Figure 2-10. SUB CHROMA PWB

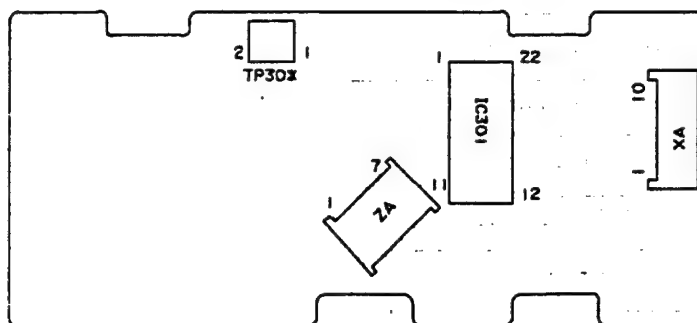


Figure 2-11. HEAD AMP PWB

■ ADJUSTMENT OF Y/C RECORDING CIRCUIT

Adjustment of EE level

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	Standard colour bar (stair-case waveform)
Test point	Video output terminal
Adjusting point	R201 (EE level control)
Specification	$1.0 \pm 0.05 \text{ Vp-p}$

Note:

The video output terminal should be terminated with a 75-ohm impedance.

1. Set the unit to the record mode.
2. Feed the colour bar signal (stair-case waveform) to the video input terminal. Observing the voltage across the terminal resistor of the video output terminal on the oscilloscope screen, adjust R201 (EE level control) to obtain the value indicated in Fig. 2-12.

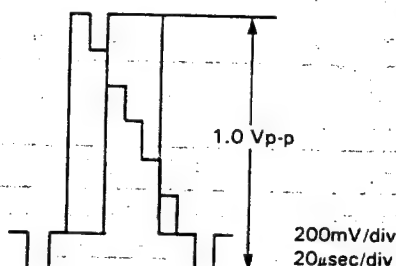


Figure 2-12.

Adjustment of FM 3.8 MHz and 4.8 MHz

Measuring instrument	Frequency counter	Oscilloscope
Mode	Recording	Self-recording / playback
Input signal	External input (no signal)	Standard colour bar (stair-case waveform)
Test point	TP203 (Pin 28 of IC201)	Video Signal
Adjusting point	R222 (FM carrier control)	R220 (deviation control)
Specification	3.8 MHz	$1.0 \pm 0.05 \text{ Vp-p}$

Note. 1:

Carry out this adjustment only when IC201 has been replaced or when the carrier setting (3.8 MHz) or the deviation (4.8 MHz) is found apparently out of specification.

Make this adjustment after the EE level has been completely adjusted.

Note. 2:

The video output terminal should be terminated with a 75-ohm impedance.

1. First make sure that the EE level playback video signal is at the specified level.
2. Place the unit in the record mode and get it ready for external input.

Note:

Do not connect anything to the external input terminal.

3. Hook up the frequency counter to TP203. Adjust R222 (FM carrier control) so that the counter reading be 3.8 MHz.

Note:

Make sure the white and dark clip controls are not now applied to the waveform.

4. Feed the colour bar signal (stair-case waveform) and make self-recording and playback.
5. Observe the video output terminal voltage (across the terminal resistor) on the oscilloscope screen. If the playback video signal level is below 1.0 Vp-p, turn R220 (deviation control) clockwise. If above 1.0 Vp-p, turn the control counter-clockwise. Now make self-recording and playback again.
6. Repeat the above step 5 to finally get the playback video signal level at $1.0 \pm 0.05 \text{ Vp-p}$, as shown in Fig. 2-12.

Adjustment of white clip

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	Standard colour bar (stair-case waveform)
Test point	TP201
Adjusting point	R225 (white clip control)
Specification	$80 \pm 10 \%$

1. Place the unit to the record mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the output at TP201, adjust R225 (white clip control) so that the white peak overshoot be 80 (tolerance $\pm 10\%$).

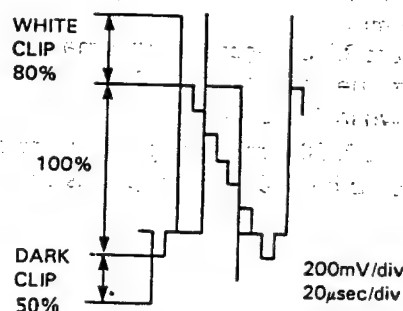


Figure 2-13.

Adjustment of dark clip

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	Standard colour bar (stair-case waveform)
Test point	TP201
Adjusting point	R224 (dark clip control)
Specification	$50 \pm 10\%$

1. Place the unit to the recording mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the output at TP201, adjust R224 (dark clip control) so that the dark peak overshoot be $40 \pm 10\%$. (See Fig. 2-13.)

Adjustment of recording current

Measuring instrument	Oscilloscope	
Mode	Recording (LP mode)	
Input signal	Standard colour bar (stair-case waveform)	
Test point	TP301 (GND at TP302) External trigger (video output terminal)	
Adjusting point	R3304 (recording FM control)	R518 (recording chroma control)
Specification	Sync tip level $84 \pm 4\text{mVp-p}$	Red level $18 \pm 1\text{mVp-p}$

Note:

TP301 and TP302 are located on the head amp PWB.

1. Place the unit to the record mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the waveform on the oscilloscope screen (external trigger at video output terminal), take the following steps.
 - a) Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively.
 - b) Turn R3304 (recording FM control) to minimum.
 - c) Adjust R518 (recording chroma control) to that the red level be $20 \pm 1\text{mVp-p}$ as shown in Fig. 2-14.
4. Adjust R3304 (recording FM control) so that the sync tip be $100 \pm 10\text{mVp-p}$ as shown in Fig. 2-15.

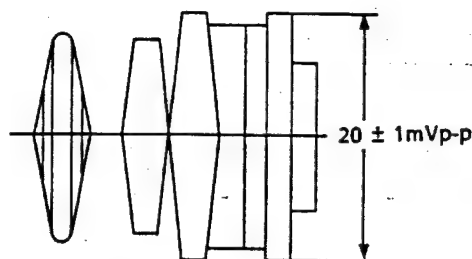


Figure 2-14.

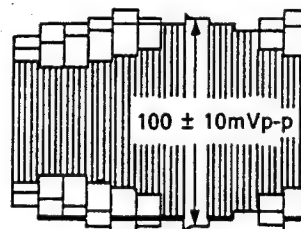


Figure 2-15.

■ ADJUSTMENT OF Y/C PLAYBACK CIRCUIT

Adjustment of playback video signal level

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape (stair-case waveform)
Test point	Video output terminal
Adjusting point	R414 (playback level control)
Specification	$1.0 \pm 0.05\text{Vp-p}$

Note:

The video output terminal should be terminated with a 75-ohm impedance.

1. Insert the alignment tape (stair-case waveform) and place the unit to the playback mode.
2. Hook up the oscilloscope to the video output terminal. Adjust R414 (playback level control) so that the on-screen waveform be $1.0 \pm 0.05\text{Vp-p}$.

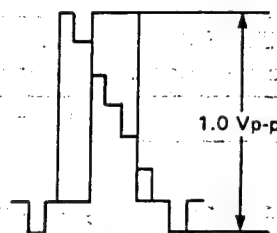


Figure 2-16.

Adjustment of APC

Measuring instrument	Frequency counter
Mode	Playback
Tape used	Alignment tape (VROCPSV)
Test point	TP501
Adjusting point	R506 (APC control)
Specification	4.433619MHz \pm 20Hz.

1. Insert the alignment tape (VROCPSV) and place the unit to the playback mode.
2. Connect the frequency counter to TP501. Adjust R506 (APC control) so that the counter reading be 4.433619MHz \pm 20Hz.

■ ADJUSTMENT OF SECAM SUB CHROMA CIRCUIT

Adjustment of record mode

Measuring instrument	Oscilloscope
Mode selection	Record mode
Input signal	Colour bar signal
Measuring point	TP5706
Adjusting control	T5703 (bell filter)
Specified value	_____

1. Set the unit in the record mode.
2. Apply a SECAM colour bar signal to the unit and record it.
3. Observe the output of TP5706 with an oscilloscope, and adjust T5703 so that the chroma signal becomes flat as shown in Fig. 2-17.

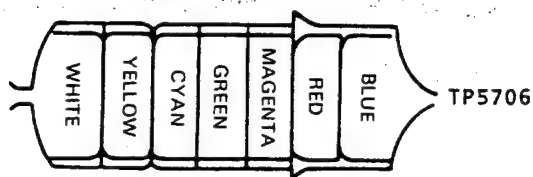


Figure 2-17.

Adjusting of sync gate in the record mode

Measuring instrument	Oscilloscope
Mode selection	Record mode
Input signal	Colour bar signal
Measuring point	TP5707 Video output terminal
Adjusting control	R5814 (Sync gate adj.) R5815 (Sync gate adj.)
Specified value	T ₁ :1.5μsec T ₂ :5.6μsec

1. Apply a SECAM colour bar signal to the unit and record it.
2. Connect an oscilloscope to TP5702 and video output terminal and make sure that the chroma signal output is just as shown in Fig. 2-18.
3. Adjust R5814 and R5815 so that the intervals T₁ and T₂ in the waveform of the output at TP5705 and those in the video output waveform should be corresponding to each other.

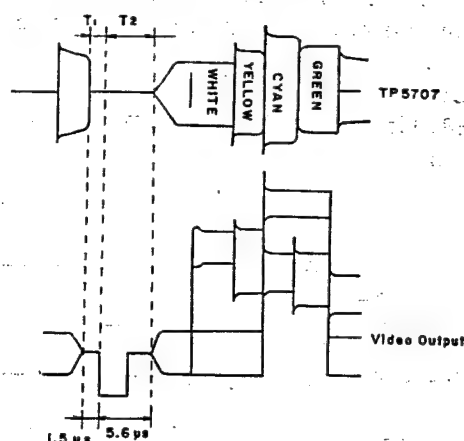


Figure 2-18.

Adjustment of recording equalizer (T5702)

1. Adjust T5702 so that the output at point (a) should be as shown in Fig. 2-19.

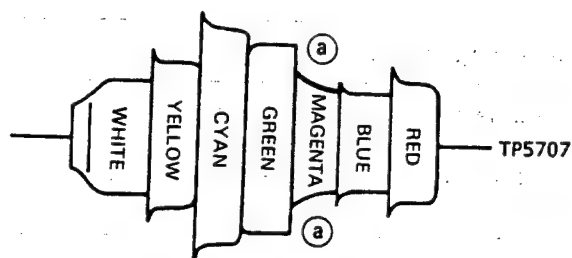


Figure 2-19.

Adjustment of record current (SECAM)

Measuring instrument	Oscilloscope
Mode selection	Record mode
Input signal	Colour bar signal
Measuring point	TP301(Ground: TP302)
Adjusting control	R5813 (Record chrominance level control)
Specified value	Cyan level: $16 \pm 2\text{mVp-p}$

1. Set the unit in the record mode.
2. Apply a SECAM colour bar signal (stair-step waveform) to the unit.
3. Observe the output of TP301 with an oscilloscope and make adjustment in the following manner.

- a) Connect the ground of the oscilloscope to TP302 and the signal to TP301.

Note:

TP301 and TP302 are located on the head amplifier PWB.

- b) Adjust R5813 (record chroma control) so that the red level should be 16mVp-p as shown in Fig. 2-20.

Note:

R5813 is located in the system control, servo PWB.

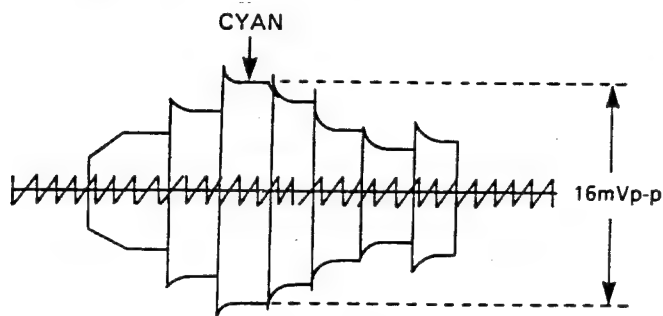


Figure 2-20.

Adjustment of playback equalizer

Measuring instrument	Oscilloscope
Mode selection	Playback mode
Input signal	Alignment tape (VRöCSSV)
Measuring point	TP5702
Adjusting control	T5701(playback equalizer)
Specified value	_____

1. Set the unit in the playback mode, and playback an alignment tape.
2. Observe the output of TP5702 with an oscilloscope, and using T5701 make the oscillating width match with the flat portion of the red and blue test pattern.

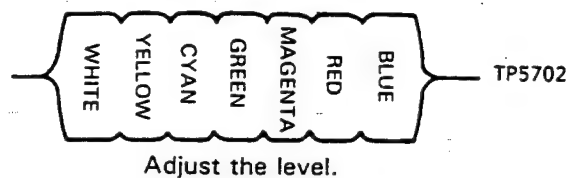


Figure 2-21.

■ ADJUSTMENT OF NTSC SUB CHROMA CIRCUIT**Adjustment of recording current**

Measuring instrument	Oscilloscope
Mode	Recording (LP mode)
Input signal	Standard colour bar (stair-case waveform)
Test point	TP301(GND at TP302)
Adjusting point	R5811 (recording chroma control)
Specification	Red level $22 \pm 2\text{mVp-p}$

Note:

TP301 and TP302 are located on the head amp PWB.

1. Place the unit to the record mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the waveform on the oscilloscope screen, take the following steps.
 - a) Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively.
 - b) Adjust R5811 (recording chroma control) to that the red level be $22 \pm 2\text{mVp-p}$ as shown in Fig. 2-22.

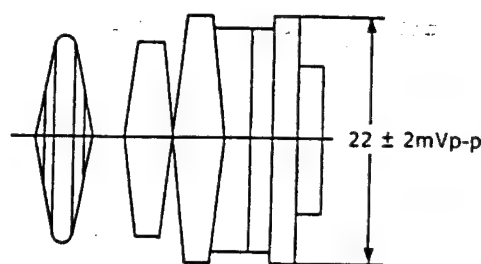


Figure 2-22.

Adjustment of APC

Measuring instrument	Frequency counter
Mode	Playback
Tape used	Alignment tape (VROCPSV)
Test point	Read of TP5708
Adjusting point	R5812 (APC control)
Specification	3.579545MHz \pm 20Hz

1. Insert the alignment tape (VROCPSV) and place the unit to the playback mode.
2. Connect the frequency counter to TP5708.
Adjust R5812 (APC control) so that the counter reading be 3.579545MHz \pm 20Hz.

Adjustment of NTSC Skew Compensation

Measuring instrument	Oscilloscope Monitor TV
Mode	Playback (SP still mode)
Tape used	Alignment tape (VROCPSV)
Test point	CH-1: TP701 CH-2: Video output terminal
Adjusting point	R440 (Flicker control)
Specification	No flicker on the monitor TV screen

1. Insert the alignment tape (VROCPSV) and place the unit to the playback still mode.
2. Observe the output of TP701 (head switching pulse) and video output with an oscilloscope.
3. Adjust R440 so that there is a video level difference of \pm 0.1V between Channel-1 output (head switching pulse's High level) and Channel-2 output (head switching pulse's Low level).
4. If the colour flicker is so noticeable on the TV monitor, finely adjust R440 so that there is the least deviation of flicker on the screen.

TROUBLESHOOTING GUIDE

TROUBLES OF CONTROL SYSTEM (SERVO, SYSTEM CONTROLLER CIRCUIT)



No.	Problems	Probable causes and countermeasures
1.	No power is supplied.	<ul style="list-style-type: none"> * The fuse is blown out: Check if there occurs a short-circuit in the internal circuit. * Check if there are produced AT6.5V, AT12V and AT9V in the power circuit: If not, this means that the power circuit is defective. * Check if the system controller (IC801) is normally functioning: Check if there are produced reset signals functioning: Check if there are produced reset signals (ACL) at pin 45 of IC801 and clock signal at pins 46 and 47 of IC801. * Check if the power control signal (Low level) goes out of pin 19 of IC801.
2.	No operation is available.	<ul style="list-style-type: none"> * Check if the end sensor signal (cassette housing side) and start sensor signal are applied to pins 56 and 57 of IC801 respectively. * Check if the unit is in timer mode. * Check if the unit is in sensor stop mode (DEW display). * The cam switch is poorly adjusted for its positioning. * Check if the unit is not in the child lock mode. * Check if the read-in of operation key is done well.
3.	After tape loading, the unit is stopped with the tape kept wound over the drum, or the cassette can't be ejected.	<ul style="list-style-type: none"> * The cam switch is poorly adjusted for its positioning. * IC803 is defective. * Check if AT 12V is supplied.
4.	The unit will stop immediately after it is set in playback or record mode.	<ul style="list-style-type: none"> * Check if the head switching pulse is applied to pin 3 (for the drum sensor) of IC801. * Check if the drum motor is rotating. * Check if the mixed signal of drum FG and drum PG is applied to pin 11 of IC701 of servo circuit.
5.	The unit will stop a few seconds after it has been set in playback or record mode.	<ul style="list-style-type: none"> * Check if the reel sensor pulse is applied to pin 58 (for the reel sensor) of IC801. * Check if the reel disk is rotating. * Check if the capstan motor is rotating. * Check if the reel idler is stained or defective.

No.	Problem	Probable causes and countermeasures
6.	The tape is not running (the tape is not taken up at loading).	<ul style="list-style-type: none"> * The reel idler is defective. * The reel brake is defective. * Check if the reel idler is stained or defective.
7.	<p>The unit stops sometimes during playback or recording.</p> <p>The tape can't be taken up when tape unloading.</p> <p>The tape is scratched when it is wound.</p> <p>Video search is impossible.</p>	<ul style="list-style-type: none"> * Check if there are produced capstan motor control signals at the system controller (servo clock signal at pin 27 of IC801, servo data signal at pin 28 of IC801, capstan motor pull up signal at pin 29 of IC801, capstan motor unloading signal at pin 30 of IC801, loading motor control forward signal at pin 63 of IC801, cassette and loading motors reverse control signal at pin 62 of IC801), IC701 is defective.
8.	Fine noises appear at the reproduced picture.	<ul style="list-style-type: none"> * Check if the mixed signal of drum PG and drum FG is applied to pin 11 of IC701. * The playback phase generator MM control is misadjusted (R751 for PAL/MESECAM signal, R753 for NTSC signal).
9.	Noises appear intermittently at the reproduced picture.	<ul style="list-style-type: none"> * Check for capstan servo circuit (capstan frequency generator's signal at pin 41 of IC701 and playback control signal at pin 40 of IC701).
10.	The picture collapses in the horizontal direction.	<ul style="list-style-type: none"> * The drum servo circuit is defective. * Check if the mixed signal of drum PG and drum FG is applied to pin 11 of IC701. * Check if the switching of 50Hz mode (PAL/MESECAM) and 60Hz mode (NTSC) is done properly.
11.	Noise bar appears in slow mode, or noise bar is not positioning properly.	<ul style="list-style-type: none"> * Check if the PB CTL signal is input to pin 1 of IC801.
12.	When system sw is in auto position, the selection of E-E (REC) mode does not function well.	<ul style="list-style-type: none"> * Check if the composite sync signal from pin 1 of AC connector is, after being removed its vertical sync signal at Q801, applied to pin 4 of IC801. * Check if the output of pin 54 of IC801 is sent to pin 15 of IC802 (at 50Hz, pin 54 is "H" level, and at 60Hz, pin 54 is "L" level). * Check if the voltages of pin 17 and pin 18 of IC802 are appropriate values (at EE (REC) mode, both pin 17 and pin 18 of IC802 are approx. 5V). * Check if the signal applied to pin 15 of IC802 is output from pins 8, 9 and 10 of IC802 (at 50Hz, pins 8, 9 and 10 are approx. 5V). * IC801 and IC802 are defective.

No.	Problems	Probable causes and countermeasures
13.	When system sw is in auto position, the selection of 50/60 Hz in PB mode does not function well.	<ul style="list-style-type: none"> * Check if the outputs from pin 52 and pin 53 of servo IC701 are sent to pin 9 and pin 10 respectively. * Check if the selecting result is sent from pin 53 of IC801 to pin 16 of IC802. * Check if the voltages of pins 17 and 18 of IC802 are appropriate values (at PB, pins 17 and 18 are 0V). * Check if the input signal to pin 16 of IC802 is output from pins 8, 9 and 10 of IC802 (at 50Hz, pins 8, 9 and 10 are approx. 5V).
14.	Linear time counter does not operate.	<ul style="list-style-type: none"> * Check if the PB CTL CLOCK signal is output from pin 47 of IC701 and is input to pin 1 of IC802. * Check if pin 3 of IC802 (RESET terminal) is kept in resetting (keeping "High" level). * Check if the counter pulse is output from pin 2 of IC802 and is input to pin 20 of IC5001 inside of timer circuit. * Check if IC802 is defective.

TROUBLES OF SOUND AND REPRODUCED PICTURE(Y/C AND AUDIO CIRCUIT)

No.	Problems		Probable causes and countermeasures
1.	No picture appears.	At E-E mode	<ul style="list-style-type: none"> * Check if the video signal (E-E signal) is applied to pin 4 of IC201, if the video signal goes out of pin 10, and if proper voltage is applied to each pin of IC201. * Check if the video signal comes into pin 6 or pin 1 of IC1502 and goes out of pin 8 of IC1502 (in tuner mode). * Check if the "EE 5V" signal is at low level at pin 7 of IC1502 and if the EE (H) signal is at high level at pin 12 of IC201. * Check if the video signal comes into pin 1 of K401 and goes out of pin 5 of K401.
		At playback of standard tape	<p>Make sure that there appears a normal picture at E-E mode.</p> <ul style="list-style-type: none"> * Check if the playback FM signal is applied to pin 4 of connector CG. * Check if the playback FM signal is applied to pins 20 and 21 of IC301. * Check if Vcc 5V is applied at pins 7 and 24 of IC401. * Check if the video signal (demodulator output) is given at pin 9 of IC401. * Check if the video signal is given at pin 25 of IC401. * Check if the base of Q210 is at high level (approx. 4V).
		At playback of the tape recorded by oneself	<p>Before this checking, make sure that normal playback is possible with standard tape.</p> <ul style="list-style-type: none"> * Check if there is FM signal at pin 9 of IC401. * Check if there is video signal at pin 6 of IC201. * Check if there is video signal at pin 10 of IC201.

No.	Problems	Probable causes and countermeasures
2.	No colour appears. (PAL / MESECAM)	<ul style="list-style-type: none"> * Check if there is chroma signal at pin 30 of IC501. * APC is misadjusted (R506). It is not allowed to readjust them, this means that IC501 is defective. * Check if IC501 is normally functioning.
3.	No colour appears in NTSC 3.58 mode.	<ul style="list-style-type: none"> * Make sure "NTSC 3.58 H" signal at pin 11 of K502 is at "H" level. * Put the unit in playback mode and check if the chroma signal is given out at pin 30 of IC5701. * Check if APC (R5812) has been properly adjusted. (If no adjustment is effective, the IC itself is defective.) * Check if the "ROTATION" pulse is put in to pin 5 of IC5701. (If the output from the system controller does not reach this pin, the IC5701 or IC501 is defective.) * Put the unit in record mode and see if the chroma signal is given out at pin 16 of IC5701. * Be sure that the voltage at each pin of IC5701 is as specified.
	No colour appears in SECAM mode.	<ul style="list-style-type: none"> * Make sure "SECAM 5V" signal at pin 22 of K503 is at "H" level. * Check if the chroma signal is applied at TP5702. * Check if the gate (R5814 and R5815) has been properly adjusted. * Check also if the bell filter (T5701, T5702 and T5703) has been properly adjusted. * Be sure that the voltage at each pin of IC5702 is as specified.
4.	No picture appears over the screen in still/slow mode or no lateral stripes in SP search mode in NTSC 3.58/4.43 mode. 	<ul style="list-style-type: none"> * Put the unit in playback mode in NTSC mode and make sure pins 6 and 10 of K401 are at 9V level. * Readjust the flicker control (R440). * With the unit in playback mode in NTSC mode, check if the video signal is given out to the emitter of Q4405. * Then make sure the video signal is given out to pin 12 of IC4401. * Finally make sure the 17-MHz clock waveform signal is put in to pin 9 of IC4401.
5.	Excessive skew is found in SP search mode in NTSC 3.58/4.43 mode.  <p>The image above and below the noise bars is seen skew as sketched here.</p>	<ul style="list-style-type: none"> * Make sure the pulse signal is put in to pin 3 of K401.

No.	Problems	Probable causes and countermeasures
6.	The picture collapses when the tape recorded by oneself is played back.	<ul style="list-style-type: none"> * Check if there is a normal voltage at each pin of the head amplifier. * Check the video head or replace it a new one.
7.	Noises appear on the whole of picture when the tape recorded by oneself is played back.	<ul style="list-style-type: none"> * Check if there is a normal voltage at each pin of the head amplifier. * Check the video head or replace it a new one.
8.	Noises is noticeable at E-E mode or when the tape recorded by oneself is played back.	<ul style="list-style-type: none"> * The tuner and/or RF converter are defective. * Check if AT 5V is applied at pin 9 of the RF converter. * Check the coaxial cable between the tuner and the RF converter for breakage. * Disconnect the antenna cable to see if the DC voltage at the tuner's AGC terminal goes above 6V.
9.	Noises appear on the picture when the tape is played back with standard tape. Tape does not run.	<ul style="list-style-type: none"> * Check each voltage and motor unit of capstan motor drive circuit. * Clean the video head or replace it a new one.
10.	There appears no E-E sound.	<ul style="list-style-type: none"> * First make sure the E-E picture appears as specified. (If not, the muting effect is produced.) * ALC at IC601 operates improperly. * Check if there is audio signal at pin 17 of IC601. * The audio muting circuit is defective.
11.	There appears no sound at playback mode.	<ul style="list-style-type: none"> * The audio head is defective. * Check if the control signal is applied. (If not, the muting effect is produced.) * Check if playback audio signal is applied to pin 7 of IC601 and goes out of pin 17.
12.	Sound is distorted.	<ul style="list-style-type: none"> * The audio head is magnetized or defective. * Bias current is insufficient.
13.	The reasonance in the recording or playback is incorrect.	<ul style="list-style-type: none"> * The audio head is magnetized or defective. * Bias oscillator circuit is defective.
14.	Recording is impossible.	<ul style="list-style-type: none"> * Bias oscillator circuit is not normally functioning. * Check if pin 12 of Audio module (bias control 9V) is at high level.
15.	Noise and hum appear frequently during playback or recording.	<ul style="list-style-type: none"> * The audio head is defective.

OTHER TROUBLESHOOTING GUIDE

COMPATI TV SERIES-NAME/CHASSIS-NAME TABLE

No.	MODEL NAME	SERIES NAME	CHASSIS NAME
1	14S11-A1	11 SYSTEM	7P-M
2	14S11-A2	SOLAR 21	7P-M
3	18S11-A1	11 SYSTEM	7P-M
4	18S11-A2	SOLAR 21	7P-M
5	20S11-A1	11 SYSTEM	7P-M
6	20S11-A2	SOLAR 21	7P-M
7	21S11-A1	11 SYSTEM	7P-M
8	21S11-A2	SOLAR 21	7P-M
9	21S21-A1	SOLAR 21	7P-W
10	21S21-A2	SOLAR 22	7P-W
11	29S21-A1	SOLAR 21	7P-LW1
12	29S21-A2	SOLAR 22	7P-LW1
13	33S21-A1	SOLAR 21	7P-LW2
14	33S21-A2	SOLAR 22	7P-LW2
15	25W11-B1	WILLING 21	8P-MW2
16	29W11-B1	WILLING 21	8P-MW1
17	C-20B1SPN	3 SYSTEM	6P-T
18	C-20B2SPN	3 SYSTEM	6P-T
19	C-20B3SPN	3 SYSTEM	6P-T
20	C-26B1SPN	3 SYSTEM	6P-L
21	C-3710SP	PAL/MESECAM DUAL	8P-SR
22	DV-2130EX	SUPER MULTI	6P-SR1
23	DV-1410SPN	11 SYSTEM	6P-M
24	DV-1810SPN	11 SYSTEM	6P-M
25	DV-2010SPN	11 SYSTEM	6P-M

Note : Some of the function keys on the remote control unit are not effective with TV sets that do not have such functions.

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:

BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "Δ" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET. BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

NOTES:

1. The unit of resistance "ohm" is omitted ($k = 1000 \text{ ohm}$, $M = 1 \text{ Meg ohm}$).
2. All resistors are 1/8 watt, unless otherwise noted.
3. The unit of capacitance "F" is omitted ($\mu = \mu F$, $p = pF$).
4. The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.

VOLTAGE MEASUREMENT CONDITIONS:

1. DC voltages are measured between points indicated and chassis ground by VTVM, with AC100V-240V, 50/60Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.
2. Voltages are measured with 10000 μ V B & W or colour signal.

WAVEFORM MEASUREMENT CONDITIONS:

10000 μ V 87.5 percent modulated colour bar signal is fed into tuner.

CAUTION:

This circuit diagram is original one. Therefore there may be a slight difference from yours.

WAVE FORMS

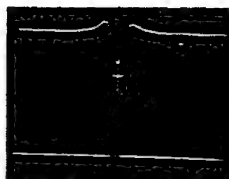
SYSTEM CONTROL, SERVO, IF PWBs



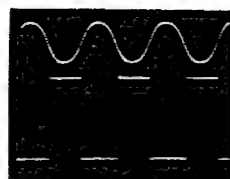
IC701 ⑪ pin
Frequency generator/Pulse generator
2V/Division
5msec/Division
TP701
Head switching pulse
2V/Division
5msec/Division
— PAL Playback mode —



IC801 ④ pin
Vertical sync
2V/Division
5msec/Division
Q801 Base
Vertical sync
0.5V/Division
5msec/Division
— PAL mode —



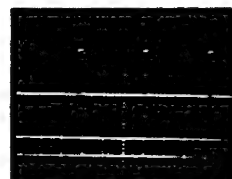
IC702 ⑧ pin
Drum pulse generator
1V/Division
10msec/Division
IC702 ⑦ pin
Drum pulse generator
2V/Division
10msec/Division
— PAL Playback mode —



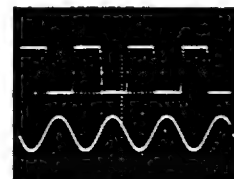
IC702 ⑭ pin
Drum frequency generator Signal
1V/Division
0.5msec/Division
IC701 ① pin
Drum frequency generator Signal
2V/Division
0.5msec/Division
— PAL Playback mode —



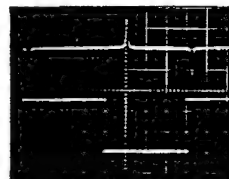
IC801 ⑨ pin
Capstan frequency generator signal
2V/Division
5msec/Division
IC801 ⑩ pin
Playback control signal
2V/Division
5msec/Division
— PAL Playback mode —



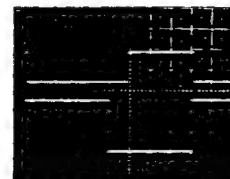
IC701 ⑥⑤ pin
Composite sync
2V/Division
20msec/Division
IC701 ⑥③ pin
fsc clock
500mV/Division
20msec/Division
— PAL Playback mode —



IC701 ④① pin
Capstan frequency generator signal
2V/Division
0.5msec/Division
Connector, AN ①⑤ pin
Capstan frequency generator signal
1V/Division
0.5msec/Division
— PAL Playback mode —

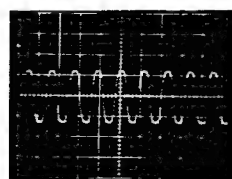


IC701 ④① pin
Playback control signal
1V/Division
5msec/Division
TP701 pin
Head switching pulse
2V/Division
5msec/Division
— PAL Playback mode —

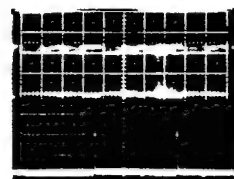


IC701 ⑥③ pin
Record control signal
2V/Division
5msec/Division
TP701 pin
Head switching pulse
2V/Division
5msec/Division
— PAL Record mode —

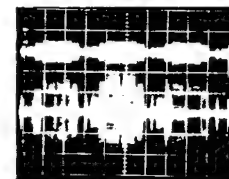
Y/C, AUDIO PWB



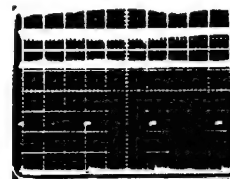
TP504
4.43MHz oscillator signal
0.2msec/Division
0.2V(AC)/Division
— PAL Playback mode —



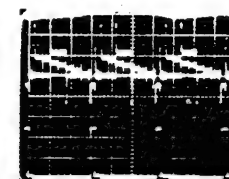
Connector CG ① pin
Vertical sync pulse
5msec/Division
1V(DC)/Division
— Record mode —



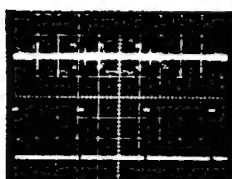
Q501, Q502 emitter
Playback chrominance signal
20msec/Division
0.1V(AC)/Division
Q505, Q506, Q507 emitter
Playback chrominance signal
20msec/Division
0.1V(AC)/Division
— Playback mode —



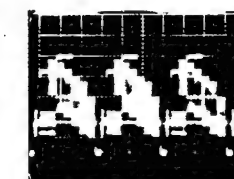
TP202
Luminance FM signal
20msec/Division
0.5V(AC)/Division
IC201 ② pin
Horizontal sync pulse
20msec/Division
2V(DC)/Division
— Record mode —



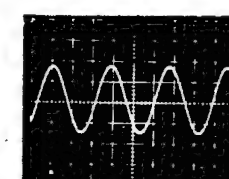
TP201
Preemphasis signal (Y signal)
20msec/Division
0.2V(AC)/Division
IC201 ② pin
Horizontal sync pulse
20msec/Division
2V(DC)/Division
— Record mode —



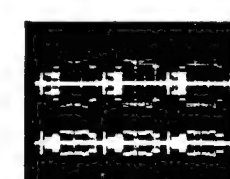
Q503 emitter
Record chrominance output signal
20msec/Division
50mV(AC)/Division
IC201 ② pin
Horizontal sync pulse
20msec/Division
2V(DC)/Division
— Record mode —



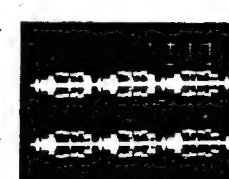
Video output terminal
(Terminated with 75 ohm resistor)
Video output signal
20msec/Division
0.2V(AC)/Division
— E-E mode —



Full erase bias
5msec/Division
20V(AC)/Division



Q5707 emitter
20msec/Division
200mV (AC)/Division
TP5707 (Q5702 emitter)
20msec/Division
100mV (AC)/Division
— NTSC Record mode —



Q5707 emitter
20msec/Division
200mV/Division
Q5701 emitter
20msec/Division
500mV/Division
— NTSC Playback mode —



TP5706
20msec/Division
500mV (AC)/Division
TP5707
20msec/Division
50mV (AC)/Division
— SECAM Record mode —



TP5706
20msec/Division
500mV (AC)/Division
Q5705 emitter
20msec/Division
200mV/Division
— SECAM Playback mode —

MEMO

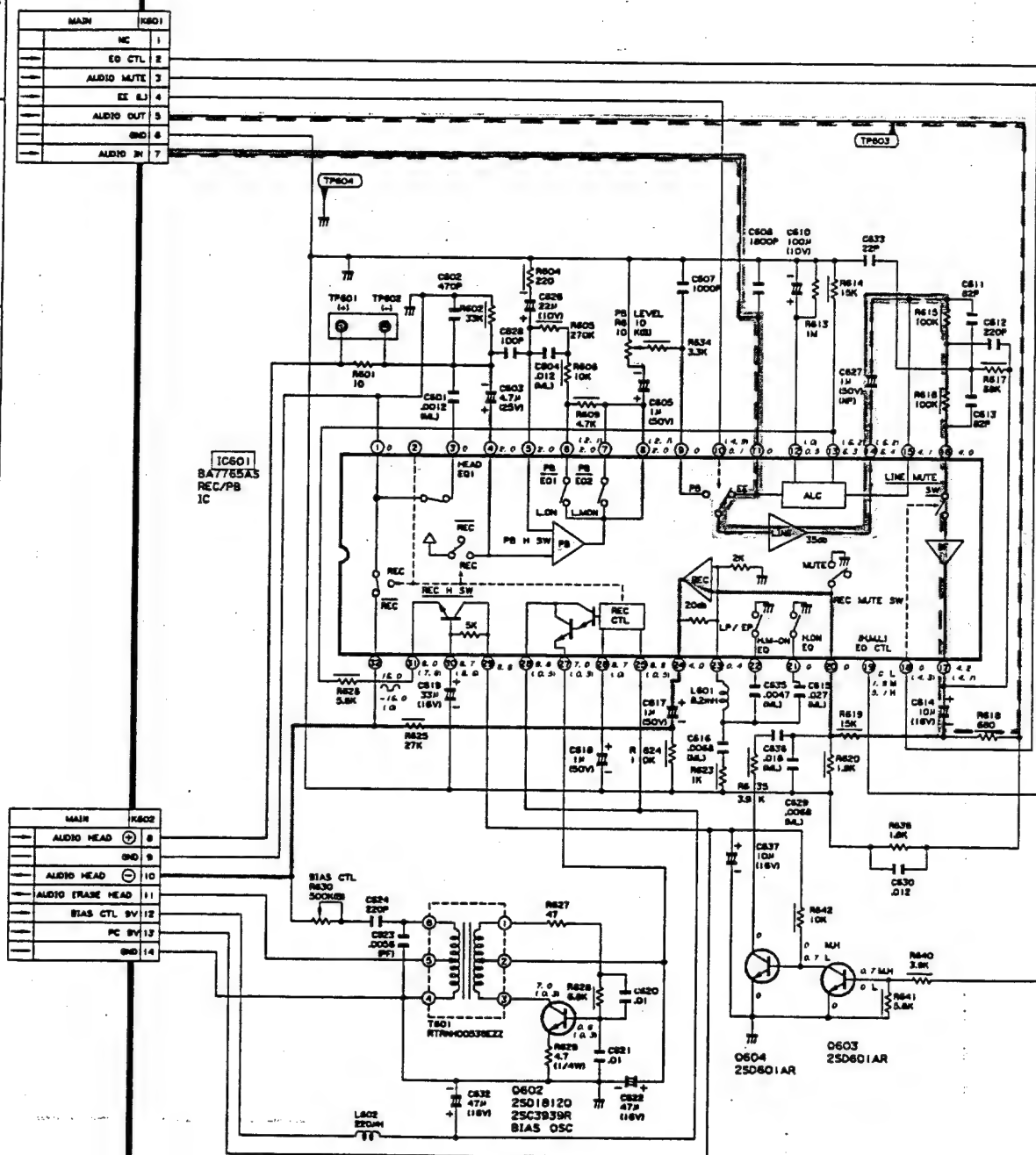
AUDIO CIRCUIT

Audio Playback Signal

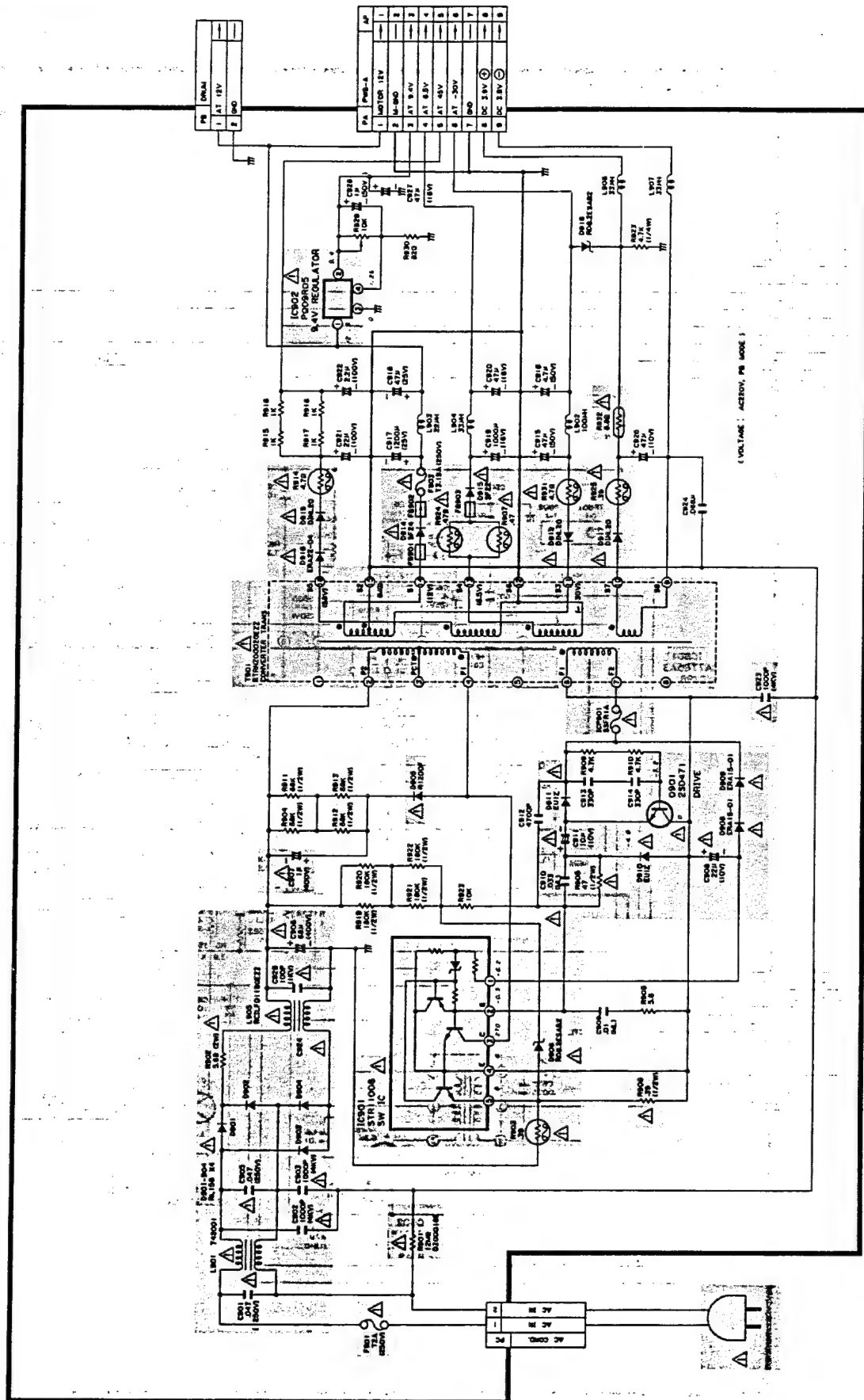
Audio Record Signal

Audio E-E Signal

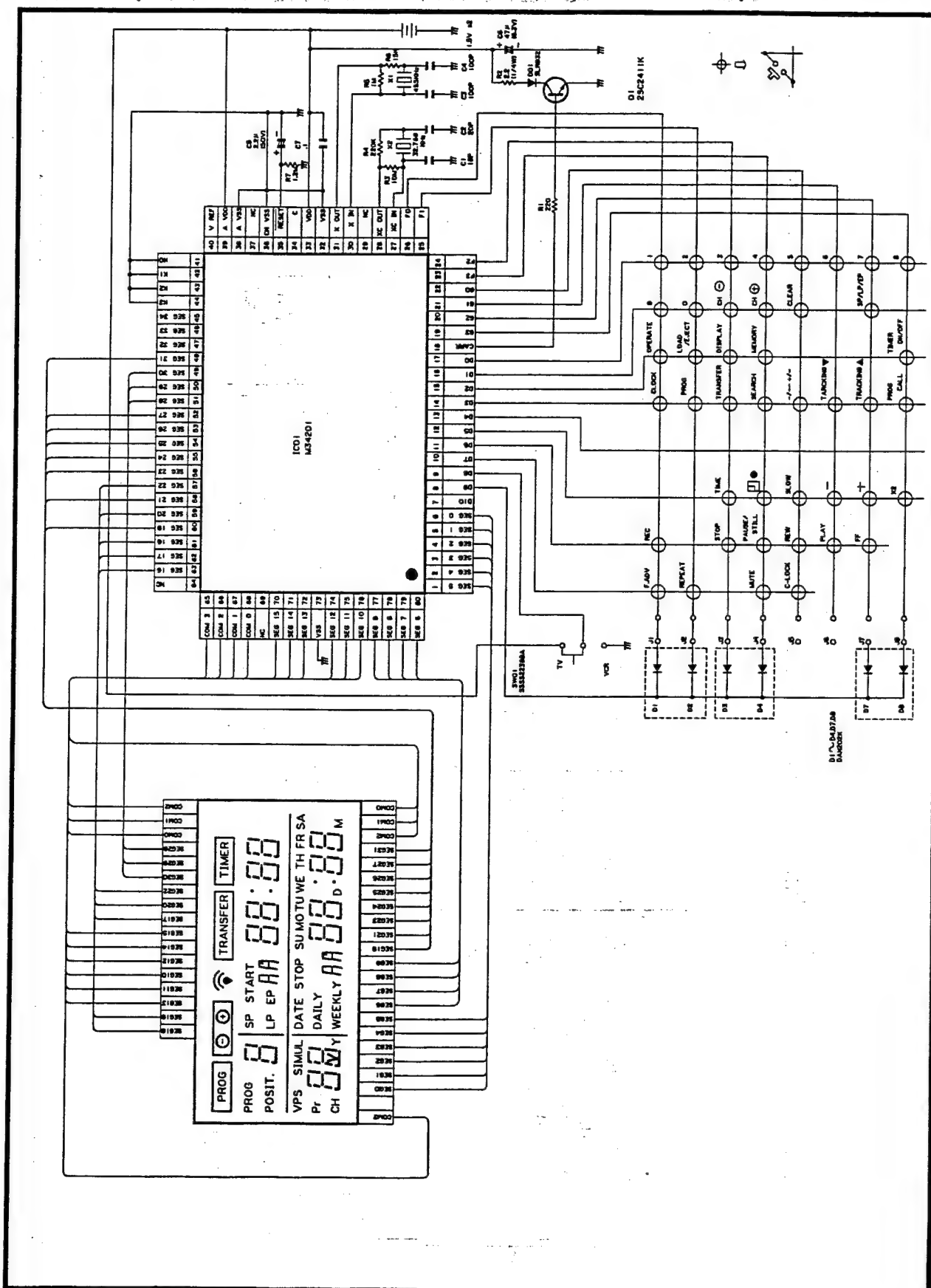
RUNTK0526GEZZ

 Printed Resistor Circuits

POWER CIRCUIT

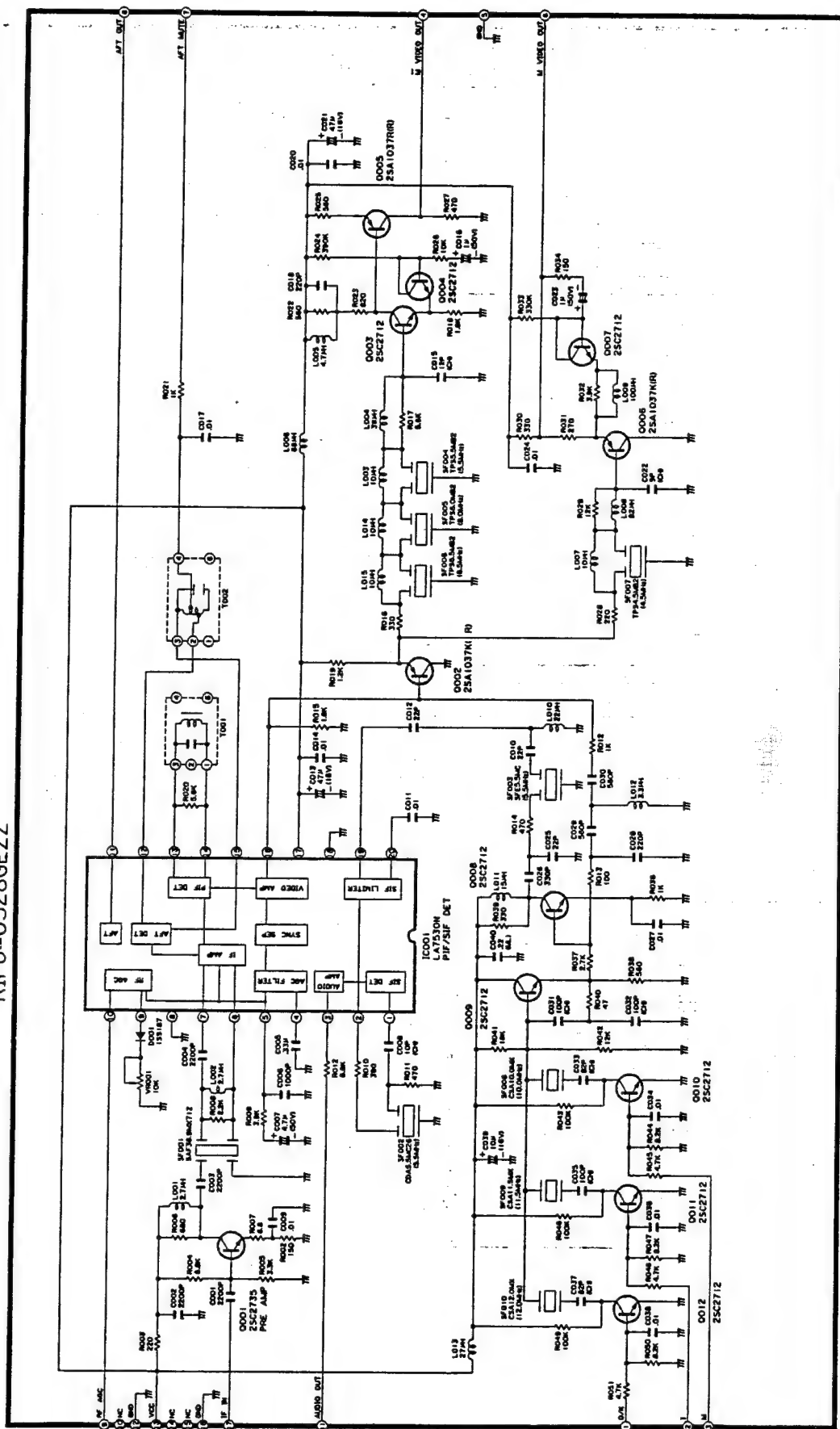


INFRARED REMOTE CONTROL CIRCUIT

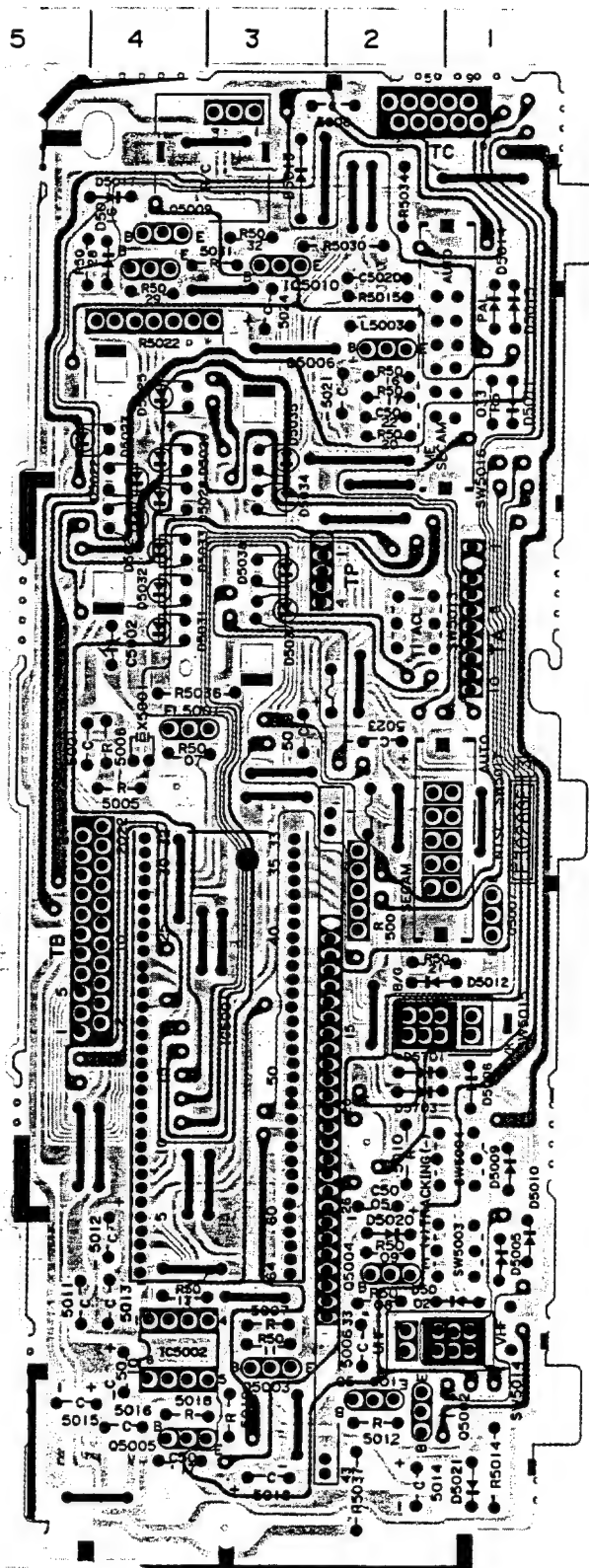


IF PACK CIRCUIT

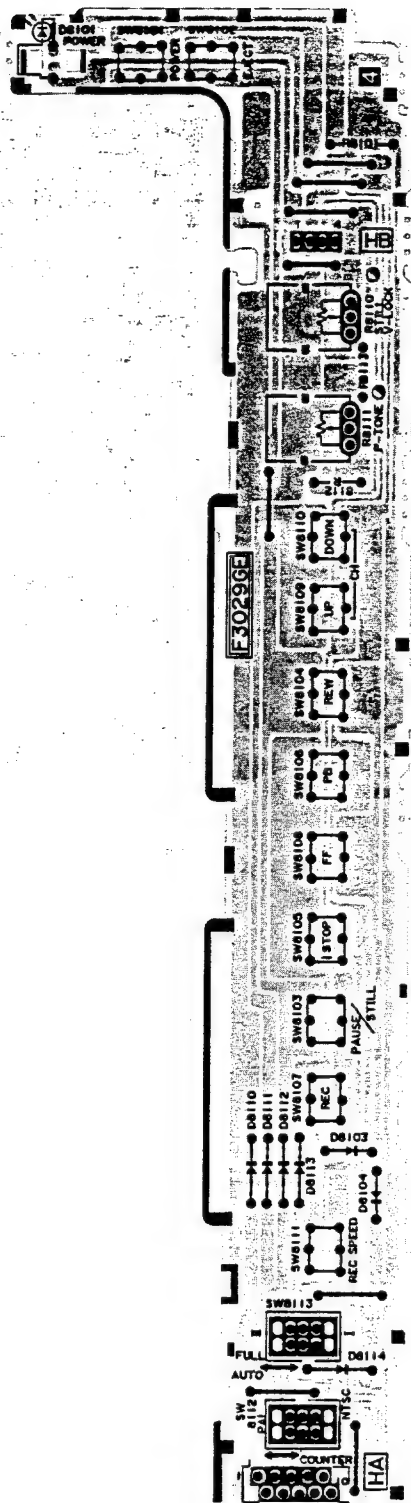
RIFU-0528GEZZ



SYSTEM CONTROL, SERVO PWB

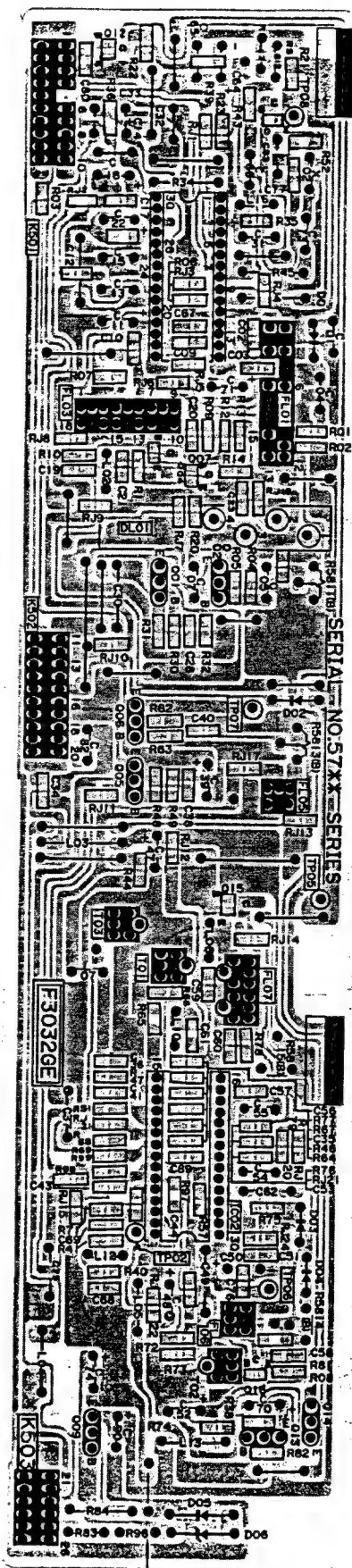


TIMER PWB

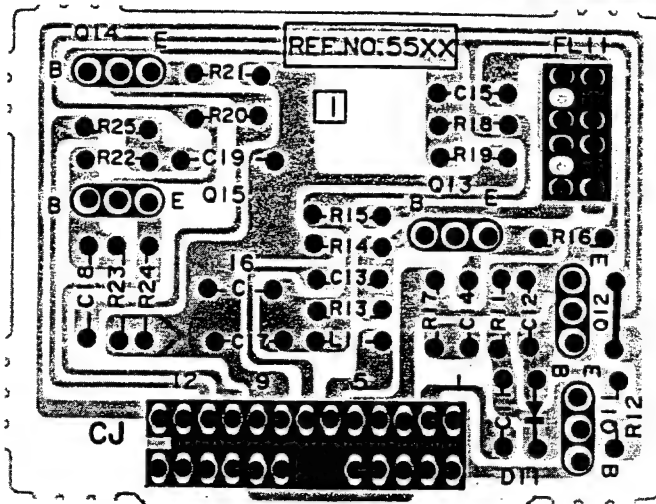


OPERATION PWB

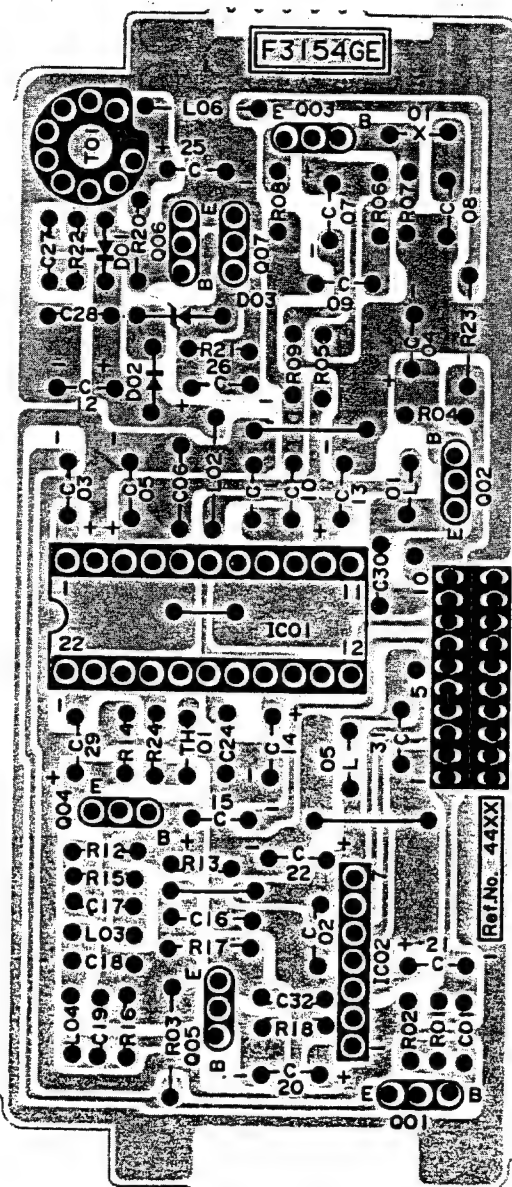




SUB CHROMA PWB



PAL SKEW CONTROL PWB



NTSC SKEW CONTROL PWB



REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by Δ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION
5. PRICE CODE

Δ MARK: SAFETY RELATED PARTS

PWB ASSEMBLY IS NOT REPLACEMENT ITEM

REF.NO.	PART NO.	DESCRIPTION	CODE
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MAIN CIRCUIT

PWB-A	DUNTK3026TM51	Main Bord Assembly	—
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TRANSISTORS

Q 201, 502, 503, 504, 505, 506, 509, 510, 511, 516, 518, 1501	VS2SC2412 KQ - 1	2SC2412KQ	AA
Q 202, 203, 205, 207, 210, 404, 517, 521, 1502, 1503,	VSDTC144 EK / - 1	DTC144EK	AB

REF.NO.	PART NO.	DESCRIPTION	CODE
1504, 1505, 1506, 3303, 6601, 6606			
Q 204, 403,	VS2SC1815YW - 1	2SC1815YW	AC
Q 206, 401, 402, 507, 508, 3301, 3302	VS2SA1037 KQ - 1	2SA1037KQ	AA
Q 208, 6604	VSDTA144 EK / - 1	DTA144EK	AC
Q 209, 501, 6602, 6603, 6605	VS2SD655 - DE 1E	2SD655	AC
Q 407	VS2C1740 SQ R1E	2SC1740SQR	AC
Q 408	VSDTC124 EK / - 1	DTC124EK	AB
Q 409	VS2SA933 SQR 1E	2SA933SQR	AB
Q 410, 6607	VSDTA144 ES / - 1	DTA144ES	AB

INTEGRATED CIRCUITS

IC201	VHi AN3215NK - 1		AP
IC401	VHi AN3321K / - 1		AR
IC501	VHi TA8644N / - 1		AP
IC502	VHi BA7007 // - 1		AM
IC1501	RH - i X0203GEZZ		AE
IC1502	VHi TA7348P / - 1		AK
IC1503	RH - i X0037CEZZ or VH i UPC574JT - 1		AF AC

DIODES AND CRYSTAL

D 201, 203, 204, 205, 206, 208, 401, 402, 403, 405,	RH - DX0048GEZZ	1N4531	AA
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REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
406, 502, 503, 506, 507, 508, 509, 510, 511, 512, 6602, 6603	RH - EX0374GEZZ	HZS6B1/TA	AA	L 409, 513, 1502, 3304	VP - D F221K0000	220μH	AB
L 410				VP - X F820K0000	82μH	AB	
L 501				VP - X F180K0000	18μH	AB	
L 502	VP - X F390K0000	39μH	AB	L 503, 504, 515	VP - X F221K0000	220μH	AB
L 505	VP - M K561K0000	560μH	AB	L 506	VP - D F271K0000	270μH	AB
L 506	VP - D F271K0000	270μH	AB	L 514	VP - Y F153J0000	15mH	AC
L 1503	VP - D F680K0000	68μH	AB	T 1501	RC I L I 0085GEZZ	Trap coil	AD
T 1502	RC I L I 0084GEZZ	Trap coil	AD				
CONTROLS				CAPACITORS			
R 201, 224, 225, 414	RVR - M4419GEZZ	47k (B) E-E level adj. 47k (B) Dark clip adj. 47k (B) White clip adj. 47k (B) Playback level adj.	AB	C 218, 230, 508	VCF YHA 1HA104J	0.1μF, 50V, 5%, Mylar	AB
R 220, 222	RVR - M4415GEZZ	10k (B) Deviation adj. 10k (B) Carrier adj.	AB	C 231, 438	VCEAGA1AW227M	220μF, 10V, 20%, Electrolytic	AB
R 440	RVR - B4338GEZZ	2.2k (B) Flicker adj.	AC	C 234	VCF YHA 1HA334J	0.33μF, 50V, 5%, Mylar	AC
R 506	RVR - M4380GEZZ	100k (B) APC adj.	AC	C 433, 434	VCE ADA0JW477M	470μF, 6.3V, 20%, Electrolytic	AB
R 518	RVR - M4411GEZZ	2.2k (B) PAL Rec. C level adj.	AB	C 504	RC - QZA392TAYJ	3900pF, 50V, 5%, Mylar	AB
R 3304	RVR - M4409GEZZ	1k (B) Rec. Y level adj.	AB	C 506	RC - QZA222TAYJ	2200pF, 50V, 5%, Mylar	AB
COILS AND TRANSFORMERS				C 555, 6601	RC - QZA273TAYJ	0.027μF, 50V, 5%, Mylar	AB
DL401	RC I L Z0199GEZZ	Delay line	AM	C 568	VCF YHA 1HA393J	0.039μF, 50V, 5%, Mylar	AB
DL501	RC I L Z0292GEZZ	Delay line	AP	C 1507, 1508	VCF YSA1J A334J	0.33μF, 63V, 5%, Mylar	AB
DL502	RC I L Z0293GEZZ	Delay line	AP	C 1512	VCEAGA1CW337M	330μF, 16V, 20%, Electrolytic	AC
FL503	RF I LC0029 TAZZ	Filter	AD	C 1516	VCE 9EA1CW226M	22μF, 16V, 20%, Electrolytic (N.P.)	AC
L 202	VP - M K470K0000	47μH	AB	C 3307	VCE 9EA1HW105M	1.0μF, 50V, 20%, Electrolytic (N.P.)	AC
L 401	VP - D F101K0000	100μH	AB	RESISTOR			
L 402, 403	VP - X F121K0000	120μH	AB	R 244, 501	VRG - RT2EB2R2J	2.2 ohm, 1/4W, 5%, Fusible resistor	AB
L 404, 405	VP - X F120K0000	12μH	AB				
L 406, 3302	VP - X F680K0000	68μH	AB				
L 407, 3301, 3303	VP - X F151K0000	150μH	AB				
L 408	VP - X F150K0000	15μH	AB				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
MISCELLANEOUS				817			
	Ri FU - 0528GEZZ	IF Pack	BC	Q 708,	VSDTC144 ES / - 1	DTC144ES	AB
	RC NV R0042GEZZ	RF Converter	BD	713			
	VT UVTSA6S2Z //	Tuner	BG	Q 709	VS2SD468 - C / - 1	2SD468	AD
	RU NT K0526GEZZ	Audio Unit	—	Q 802	VS2SA1271 - Y - 1	2SA1271	AB
	QJ AK E0054GEZZ	Jack, Video In	AC	Q 805	VS2SB 1117 KU1E	2SB1117KU	AE
	QJ AK E0100GEZZ	Jack, Video Out	AH	Q 815	VS2SC2001 LK - 1	2SC2001LK	AA
	QJ AK E0101GEZZ	Jack, Audio Out	AH				
	QJ AK E0106GEZZ	Jack, Audio In	AB				
	QPLG N0278GEZZ	Plug, 2 pin (CH)	AA				
	QPLG N0328 TAZZ	Plug, 3 pin (TP)	AD				
	QPLG N0578GEZZ	Plug, 5 pin (CE)	AB				
	QPLG N0678GEZZ	Plug, 6 pin (CC)	AB				
	QPLG N0679GEZZ	Plug, 6 pin (K503)	AB				
	QPLG N0878GEZZ	Plug, 8 pin (CB, CF)	AC				
	QPLG N1078GEZZ	Plug, 10 pin (CD, CG)	AC				
	QPLG N1079GEZZ	Plug, 10 pin (K501, 502)	AB				
	QPLG N1279GEZZ	Plug, 12 pin (K505)	AC				
	QS 6 CN1894GEZZ	Socket, 18 pin (CA)	AD				
FL201	RM PTD0219GEZZ	Packaged circuit	AG				
FL202	RM PTD0220GEZZ	Packaged circuit	AK				
FL501	RM PTD0239GEZZ	Packaged circuit	AG				
FL502	RM PTD0221GEZZ	Packaged circuit	AK				
SYSCON SERVO CIRCUIT							
	DUNTK3027HE51	Syscon Servo Board Assembly	—				
TRANSISTORS							
Q 701,	VS2SA933 SQ R1E	2SA933SQR	AB				
702,							
707,							
714,							
803,							
807							
Q 703,	VSDTA124 ES / - 1	DTA124ES	AB				
808,							
809,							
818							
Q 704,	VS2C1740 SQ R1E	2SC1740SQR	AC				
710,							
801,							
810,							
811,							
812,							
813,							
814,							
816,							
INTEGRATED CIRCUITS							
	IC701	RH - i X0522GEZZ					AT
	IC702	VH i i R3702 / - 1					AF
	IC703	VHi BU4052B / - 1					AE
	IC801	RH - i X0485GEZZ					AW
	IC802	RH - i X0479GEZZ					AL
	IC803	VHi BA6209 / - 1					AK
	IC804	VHi PST529 H2 - 1					AD
DIODES AND CRYSTAL							
	D 701,	RH - DX0048GEZZ					AA
	702,						
	703,						
	704,						
	705,						
	707,						
	709,						
	710,						
	711,						
	712,						
	713,						
	714,						
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	809,						
	811,						
	812,						

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
814, 815, 816, 817 D 719 D 810 D 813 X 701	RH - EX0123GEZZ RH - DX0052GEZZ RH - EX0135GEZZ RC RS B0009GEZZ	HZS3.6EB1 ERA15-02 HZS5.1EB3 Crystal	AA AB AA AL	C 736 C 737 C 739 C 744 C 745 C 760 C 825 C 738, 828 C 829 C 830	RC - QZA472TAYJ VCF YHA 1HA333J VCE9 EA1HW225M RC - QZA562TAYJ VCF YHA 1HA334J VCF YHA 1HA104J RC - QZA102TAYJ VCF YHA 1HA124J VCF YHA 1HA393J VCF YHA 1HA563J	4700pF, 50V, 5%, Mylar 0.033μF, 50V, 5%, Mylar 2.2μF, 50V, 20%, Electrolytic (N.P.) 5600pF, 50V, 5%, Mylar 0.33μF, 50V, 5%, Mylar 0.1μF, 50V, 5%, Mylar 1000pF, 50V, 5%, Mylar 0.12μF, 50V, 5%, Mylar 0.039μF, 50V, 5%, Mylar 0.056μF, 50V, 5%, Mylar	AB AB AB AB AC AB AB AB AB AB AB
CONTROLS				RESISTORS			
R 751 R 753 R 755, 757, 759, 761, 763, 854, 855, 856, 857 R 797	RVR - M4421GEZZ RVR - M4176GEZZ RVR - M4423GEZZ RVR - M4409GEZZ	100k (B) 50Hz SW pulse adj. 680k (B) 60Hz SW pulse adj. 220k (B) 60Hz LP delay adj. 220k (B) 50Hz SP delay adj. 220k (B) 50Hz LP delay adj. 220k (B) 60Hz SP delay adj. 220k (B) 60Hz EP delay adj. 220k (B) 50Hz SP Slow/Still tracking adj. 220k (B) 50Hz LP Slow/Still tracking adj. 220k (B) 60Hz SP Slow/Still tracking adj. 220k (B) 60Hz LP Slow/Still tracking adj. 1k (B) PC5V adj.	AB AB AB AB	R 890, 7706	VRG - RT2EB2R2J	2.2 ohm, 1/4W, 5%, Fusible resistor	AB
COIL AND FILTER				MISCELLANEOUS			
FL801 L 706	R F i LC0091GEZZ VP - X F101K0000	Filter 100μH	AD AB	ALM801	QPLG N0278GEZZ QPLG N0378GEZZ QPLG N0478GEZZ QPLG N0578GEZZ QPLG N0628TAZZ QPLG N0678GEZZ QPLG N0878GEZZ QPLG N0978GEZZ QS 6 CN1894GEZZ QS 6 CN2294GEZZ QS 6 CN2794GEZZ RA LMB0010GEZZ	Plug, 2 pin (AD) Plug, 3 pin (AH) Plug, 4 pin (Aδ) Plug, 5 pin (AL) Plug, 6 pin (TP) Plug, 6 pin (AC) Plug, 8 pin (AB) Plug, 9 pin (AP) Socket, 18 pin (AA) Socket, 22 pin (AT) Socket, 27 pin (AM) Alarm	AA AB AB AB AB AB AC AC AD AD AD AD
CAPACITORS				OPERATION CIRCUIT			
C 703 C 713 C 714 C 720, 815 C 722 C 730, 814, 819 C 735, 757	VCE9 EA1CW106M RC - QZA123TAYJ VCE9 EA1CW226M VCE9 EA1HW105M VCF YHA 1HA683J RC - K Z0017GEZZ VCF YHA 1HA473J	10μF, 16V, 20%, Electrolytic (N.P.) 0.012μF, 50V, 5%, Mylar 22μF, 16V, 20%, Electrolytic (N.P.) 1.0μF, 50V, 20%, Electrolytic (N.P.) 0.068μF, 50V, 5%, Mylar 0.047μF, 16V, +80%--20% Ceramic 0.047μF, 50V, 5%, Mylar	AC AB AC AC AB AA AB		DUNTK3029HE51	Operation Board Assembly	—
				DIODES			
				D 8101 D 8103, 8104, 8110, 8111, 8112, 8113, 8114	RH - PX0167GEZZ RH - DX0048GEZZ	LED 1N4531	AB AA

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
CONTROLS				DIODES AND CRYSTAL			
R 8110 R 8111	RVR - B4345GEZZ RVR - B4293GEZZ	200k (B) Vertical-Lock adj. 20k (B) Picture tone adj.	AC AC	D 5001, 5002, 5005, 5006, 5009, 5010, 5011, 5012, 5013, 5014, 5015, 5016, 5017, 5020, 5021	RH - DX0048GEZZ	1N4531	AA
MISCELLANEOUS				D 5022, 5023, 5024, 5028, 5029, 5034, 5035	RH - PX0134GEZZ	LED	AC
SW8101, 8102, 8103, 8104, 8105, 8106, 8107, 8108, 8109, 8110, 8111	QPLG N0478GEZZ QS 6 CN1094GEZZ QSW - K0052GEZZ	Plug, 4 pin (HB) Socket, 10 pin (HA) Switch, Power Switch, Eject Switch, Pause/Still Switch, REW Switch, Stop Switch, Playback Switch, Record Switch, FF Switch, Channel up Switch, Channel down Switch, Record speed	AB AC AB	D 5025 D 5031, 5032, 5033	RH - PX0135GEZZ RH - PX0159GEZZ	LED LED	AC AB
SW8112, 8113	QSW - S0122GEZZ	Switch, Counter Switch, Full auto	AD	D 5037, 5038	RH - PX0158GEZZ	LED	AB
TIMER CIRCUIT				X 5001	RC RS B0059GEZZ	Crystal	AD
	DUNTK3028HE51	Timer Board Assembly	—	COIL AND FILTER			
TRANSISTORS				FL5001 L 5003	RF i LC0090 GEZZ VP - X F100K0000	Filter 10μH	AD AB
Q 5001, 5004 Q 5002 Q 5003 Q 5005, 5008 Q 5006 Q 5007 Q 5009 Q 5010	VS2 SA1561Q / 1E VSDTC124 ELT - 1 VSDTC144 ELT - 1 VS2SC4038 R / 1E VS2C1740 SQ R1E VSDTA124 ELT - 1 VSDTC143 ELT - 1 VS2SC2021 - R - 1	2SA1561Q DTC124EL DTC144EL 2SC4038R 2SC1740SQR DTA124EL DTC143EL 2SC2021(R)	AC AA AB AB AC AB AB AB	TRIMMER			
INTEGRATED CIRCUITS				C 5002	RT6 - H1005 AEZZ	Oscillation adj.	AC
IC5001 IC5002	RH - i X0486GEZZ VHi MSM16905 - 1		AX AL	CAPACITORS			
				C 5014 C 5022	RC - E Z0114GEZZ VCF YSG 1HA224J	0.047μF, 5.5V, +80%—20%, Electrolytic 0.22μF, 50V, 5%, Mylar	AG AD

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
MISCELLANEOUS				L 303	VP - X F180K0000	18μH	AB
DG 5001 R 5001 R 5022 SW5003, 5004, 5013 SW5014, 5015 SW5016 SW5017	RR MCU0037GEZZ	Infrared remote control unit	AL	L 305	VP - X F151K0000	150μH	AB
	QPLG N0428TA ZZ	Plug, 4 pin (TP5001~5004)	AB	CAPACITORS			
	QPLG N1080 GEZZ	Plug, 10 pin (TA)	AC	C 323	VCOY WA1HA473J	0.047μF, 50V, 5%, Mylar	AB
	QS 5 CN1094 GEZZ	Socket, 10 pin (TC)	AC	C 350	VCF YHA 1HA104J	0.10μF, 50V, 5%, Mylar	AB
	QS 5 CN2295 GEZZ	Socket, 22 pin (TB)	AD	MISCELLANEOUS			
	V VK12BT27GK - 1	Fluorescent display tube	AX		QPLG N0229 TAZZ	Plug, 2 pin (TP31, 32)	AB
	RM PTC0107GEZZ	Packaged circuit	AB		QPLG N1080 GEZZ	Plug, 10 pin (XA)	AC
	RM PTC0128GEZZ	Packaged circuit	AC		QS 5 CN0732 REZZ	Socket, 7 pin (ZA)	AC
	QSW - K0052GEZZ	Switch, Tracking (+)	AB	SUB CHROMA CIRCUIT			
	QSW - S0123GEZZ	Switch, VHF/UHF	AD		DUNTK3032TM50	Sub Chroma Board Assembly	—
HEAD AMP CIRCUIT				TRANSISTORS			
	DUNTK2970XM50	Head Amp Board Assembly	—	Q 5701, 5702, 5705, 5706	VS2C1740 SQ R1E	2SC1740SQR	AC
TRANSISTORS				Q 5704, 5707, 5711	VS2SC2412 KQ - 1	2SC2412KQ	AA
Q 301, 302	VS2SD655 - DE 1E	2SD655	AC	Q 5709	VS2SD655 - DE 1E	2SD655	AC
Q 303, 304	VS2SA933 SQ R1E	2SA933SQR	AB	Q 5712, 5715	VSDTC144 EK / - 1	DTC144EK	AB
Q 305, 306, 307, 308	VS2SC2412 KQ - 1	2SC2412KQ	AA	Q 5713, 5714	VS2SA733 A PQ1E	2SA733APQ	AC
Q 309	VS2SC1923 - 5 1E	2SC1923	AD	Q 5716	VS2SA1037 KQ - 1	2SA1037KQ	AA
Q 310	VS2C1740 SQ R1E	2SC1740SQR	AC				
Q 311	VS2 SA 1015Y / 1E	2SA1015Y	AC				
Q 312	VS2SC1815YW - 1	2SC1815YW	AC				
Q 315	VSDTC144EK / - 1	DTC144EK	AB				
INTEGRATED CIRCUIT				INTEGRATED CIRCUITS			
IC 301	VHi AN3311K / - 1		AS	IC 5701	VHi TA8644N / - 1		AP
DIODE				IC 5702	VHi BA7107S / - 1		AS
D 301	RH - DX0048GEZZ	1N4531	AA	DIODES			
COILS				D 5701, 5702, 5703, 5704, 5705	RH - DX0048GEZZ	1N4531	AA
L 301	VP - X F270K0000	27μH	AB				
L 302	VP - X F330J0000	33μH	AB				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
D 5706 X 5702	RH - EX0135GEZZ RC RSB0009 GEZZ	HZS5.1EB3 Crystal	AA AL	MISCELLANEOUS			
CONTROLS				FL5701	QS 5 CN0679 GEZZ	Socket, 6 pin (K503)	AC
R 5811	RVR - B5443CEZZ	2k (B) NTSC record C level adj.	AB	FL5703	QS 5 CN1079 GEZZ	Socket, 10 pin (K501, 502)	AC
R 5812	RVR - M4380GEZZ	100k (B) APC adj.	AC	FL5705	RM PTD0224GEZZ	Packaged circuit	AG
R 5813	RVR - B5442CEZZ	1k (B) SECAM record C level adj.	AB	FL5706	RM PTD0223GEZZ	Packaged circuit	AK
R 5814	RVR - B5446CEZZ	10k (B) Gate 1 adj.	AB	FL5707	RM PTD0257GEZZ	Packaged circuit	AE
R 5815	RVR - M4414GEZZ	6.8k (B) Gate 2 adj.	AB		RM PTD0149GEZZ	Packaged circuit	AD
COILS AND TRANSFORMERS							AH
CAPACITORS				PAL SKEW CIRCUIT			
DL5701	RC i LZ 0208GEZZ	Delay line	AN		DUNTK3094HE50	PAL Board Assembly	—
L 5702	VP - X F470K0000	47μH	AB	TRANSISTORS			
L 5703	VP - D F101K0000	100μH	AB	Q 5511,	VS2C1740 SQ R1E	2SC1740SQR	AC
L 5704	VP - D F271K0000	270μH	AB	5513,			
L 5705	VP - X F101K0000	100μH	AB	5514,			
L 5706,	VP - X F221K0000	220μH	AB	5515			
5712				Q 5512	VSDTC144 ES / - 1	DTC144ES	AB
L 5707	VP - MK471K0000	470μH	AB	DIODE AND COIL			
L 5710	VP - X F390K0000	39μH	AB	D 5511	RH - DX0048GEZZ	1N4531	AA
L 5713	VP - D F391K0000	390μH	AC	L 5511	VP - X F220K0000	22μH	AB
L 5716	VP - X F180K0000	18μH	AB	MISCELLANEOUS PARTS			
T 5701,	RC i LV 0013GEZZ	Coil	AF	FL5511	QS 5 CN1279 GEZZ	Socket, 12 pin (K504)	AC
5702		Coil			RM PTD0339GEZZ	Packaged circuit	AF
T 5703	RC i LV 0015GEZZ	Coil	AF	21 PIN JACK CIRCUIT			
RESISTOR					DUNTK3095HE50	21 Pin Jack Board Assembly	—
C 5713,	RC - K Z0011GEZZ	0.10μF, 25V, +80%—20%, Ceramic	AA	TRANSISTOR			
5766				Q 1601	VS2C1740 SQ R1E	2SC1740SQR	AC
C 5715	VCF YHA 1HA473J	0.047μF, 50V, 5%, Mylar	AB				
C 5722	VCEAEA1CW107M	100μF, 16V, 20%, Electrolytic	AC				
C 5732	RC - QZA392TAYJ	3900pF, 50V, 5%, Mylar	AB				
C 5754	RC - QZA471TAYJ	470pF, 50V, 5%, Mylar	AB				
C 5755	RC - QZA682TAYJ	6800pF, 50V, 5%, Mylar	AB				
C 5765	RC - QZA222TAYJ	2200pF, 50V, 5%, Mylar	AB				
R 5784	VRG - RF2EB2R7J	2.7 ohm, 1/4W, 5%, Fusible resistor	AB				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
DIODES				CAPACITORS			
D 1601	RH - DX0048GEZZ	1N4531	AA	C 4403	VCE 9EA1HW474M	0.47 μ F, 50V, 20%, Electrolytic (N.P.)	AB
D 1602	RH - EX0163GEZZ	HZS12EB3	AA	C 4412,	VCEA EA1CW107M	100 μ F, 16V, 20%, Electrolytic	AC
D 1603,	RH - EX0168GEZZ	HZS15EB2	AA	4422,			
1604,				4425			
1605,				C 4415	VCE 9EA1CW106M	10 μ F, 16V, 20%, Electrolytic (N.P.)	AC
1606				C 4431	VCF YHA 1HA104J	0.1 μ F, 50V, 5%, Mylar	AB
MISCELLANEOUS PART				RESISTOR			
	QS 6 CZ 2121GEZZ	Socket, 21 pin	AF	R 4423	RR - X ZQ037TAZZ	4.7 ohm, 1/4W, Fusible resistor	AB
	QPLG N0878GEZZ	Plug, 8 pin (JA)	AC	MISCELLANEOUS			
NTSC SKEW CONTROL CIRCUIT				TH4401	QS 6 CN1079GEZZ	Socket, 10 pin (K401)	AC
	DUNTK3154TM50	NTSC Skew Control Board Assembly	—		VHHNTH5D152 - 1	Thermistor	AC
TRANSISTORS				AUDIO CIRCUIT			
Q 4401,	VS2SA933 SQ R1E	2SA933SQR	AB		RUNTK0526GEZZ	Audio Board Assembly	—
4405				TRANSISTORS			
Q 4402,	VS2C1740 SQ R1E	2SC1740SQR	AC	Q 602	VS2SC3939 QR - 1	2SC3939QR	AD
4403,				Q 603,	98M2SD601AR //	2SD-601AR	AB
4404				604			
Q 4406	VS2SC2001 LK - 1	2SC2001LK	AA	INTEGRATED CIRCUIT			
Q 4407	VS2SC1815YW - 1	2SC1815YW	AC	IC 601	VHi BA7765AS - 1		AL
INTEGRATED CIRCUITS				CONTROLS			
IC 4401	VHi TL8605 P / - 1		AW	R 610	RVR - B5446CEZZ	10k (B) Playback level adj.	AB
IC 4402	VHi TA7347 P / - 1		AG	R 630	RVR - B5453CEZZ	500k (B) Bias control adj.	AB
DIODES AND CRYSTAL				COILS AND TRANSFORMER			
D 4401,	RH - DX0048GEZZ	1N4531	AA	L 601	VP - Y F822J0000	8.2mH	AC
4402				L 602	VP - Z K221K0000	220 μ H	AB
D 4403	RH - EX0159GEZZ	HZS11EB2	AA	T 601	RT RNH0053GEZZ	Oscillator transformer	AE
X 4401	RC RSB 0103GEZZ	Crystal	AG	CAPACITORS			
COILS AND TRANSFORMER				C 601	VCQYTA 1HM122J	1200pF, 50V, 5%, Mylar	AA
L 4401	VP - M K221K0000	220 μ H	AB	C 604	VCQYTA 1HM123J	0.012 μ F, 50V, 5%, Mylar	AA
L 4402	VP - D F101K0000	100 μ H	AB	C 610	VCEAAA1AW107M	100 μ F, 10V, 20%, Electrolytic	AB
L 4403	VP - X F220K0000	22 μ H	AB				
L 4404	VP - X F330K0000	33 μ H	AB				
L 4405	VP - M K680K0000	68 μ H	AB				
L 4406	VP - D F221K0000	220 μ H	AB				
T 4401	RT RN H0065GEZZ	Oscillator transformer	AF				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
C 615	VCQYTA 1HM273J	0.027 μ F, 50V, 5%, Mylar	AB	Δ D 916	95 KUB C0169 BZ	ERA22-04	AD
C 616,	VCQYTA 1HM682J	6800pF, 50V, 5%, Mylar	AB	D 918	95 KUB DAC8R2C	RD8.2ESAB2	AB
629							
C 623	VCQ PSA2HA562J	5600pF, 100V, 5%, Mylar	AB	CONTROL			
C 627	VCEANA1HW105M	0.1 μ F, 50V, 20%, Electrolytic	AC				
C 635	VCQYTA 1HM472J	4700pF, 50V, 5%, Mylar	AB	R 929	95 KUF BA103 CB	10k (B) All time 24V adj.	AC
C 636	VCQYTA 1HM183J	0.018 μ F, 50V, 5%, Mylar	AB				
MISCELLANEOUS				COILS AND TRANSFORMER			
	QPLG N0229 TAZZ	Plug, 2 pin (TP601, 602)	AB	Δ L 901	95 KUK Z0112 ZZ	Line filter	AL
	QPLG Z0707 GEZZ	Plug, 7 pin (K601, 602)	AB	L 902	95 KU KZ0256 ZZ	100 μ H	AC
				L 903	95 KU K Z0251 ZZ	22 μ H	AE
				L 904	95 KU K Z0257 ZZ	33 μ H	AE
				Δ L 905	RC i LF0119 GEZZ	Line filter	AH
				L 906,	95 KU K Z0258 ZZ	33 μ H	AC
				907			
				Δ T 901	RT RNZ0002 GEZZ	Converter trans	AQ
POWER CIRCUIT				CAPACITORS			
	CDENC0341GE00	Power Board Assembly	—	Δ C 901,	95 KUG FZ473 BF	0.047 μ F, 250V, Mylar	AG
				Δ 905			
				Δ C 902,	95 KUG CZ102 BC	1000pF, 4kV, Ceramic	AE
				Δ 903			
				Δ C 906	95 KUG BQ680AK	6.8 μ F, 400V, Electrolytic	AN
				Δ C 907	95 KUGAQ010 BM	1.0 μ F, 400V, Electrolytic	AP
				Δ C 908	95 KUGA B220GT	22 μ F, 10V, Electrolytic	AE
				C 909	95 KUG F F103AR	0.1 μ F, 50V, Mylar	AB
				Δ C 910	95 KUG F F333AR	0.033 μ F, 50V, Mylar	AB
				Δ C 911	95 KUGA B100GT	10 μ F, 10V, Electrolytic	AE
				Δ C 917	95 KUG AD122CW	1200 μ F, 25V, Electrolytic	AG
				C 919	95 KUG AC102 BU	1000 μ F, 16V, Electrolytic	AE
				C 921	95 KUGA J220 BU	22 μ F, 100V, Electrolytic	AD
				C 922	95 KUGA J2R2 BU	2.2 μ F, 100V, Electrolytic	AB
				C 923	95 KUG CZ102 BC	1000pF, 4kV, Ceramic	AE
				C 929	95 KUG CZ101 AB	100pF, 1kV, Ceramic	AC
				RESISTORS			
				Δ R 901	95 KU E Z0085 ZZ	12M ohm, 1/2W, Solid	AE
				Δ R 902	95 KUE FG5R6AA	5.6 ohm, 2W, Metal oxide	AD
				Δ R 903,	95 KUE BBR39 AF	0.39 ohm, 1/4W,	AC
				Δ 925		Fusible resistor	
				Δ R 905	95 KUE EC470 AL	47 ohm, 1/2W, Resistor	AA
				Δ R 908	95 KUE FCR39 AK	0.39 ohm, 1/2W, Resistor	AA
				Δ R 914,	95 KUE BB4 R7AC	4.7 ohm, 1/4W,	AC
				Δ 931		Fusible resistor	
Δ D 901,	95 KUB C0213 FZ	RL156	AC				
Δ 902,							
Δ 903,							
Δ 904							
Δ D 905	95 KUB C0214 BZ	R1200F	AC				
Δ D 906	95 KUB DAC8R2C	RD8.2ESAB2	AB				
	or						
	95 KUB D0442 CZ	RD8.2ESB2	AB				
Δ D 908,	95 KUB C0125 AZ	ERA15-01	AB				
Δ 909							
Δ D 910,	95 KUB C0143 AA	EU1Z	AD				
Δ 911							
Δ D 912,	95 KUB C0178 AZ	D1NL20	AD				
Δ 917,							
Δ 919							
Δ D 914	95 KUB C0212 BZ	SF24	AE				
Δ D 915	95 KUB C0212 AZ	SF22	AE				

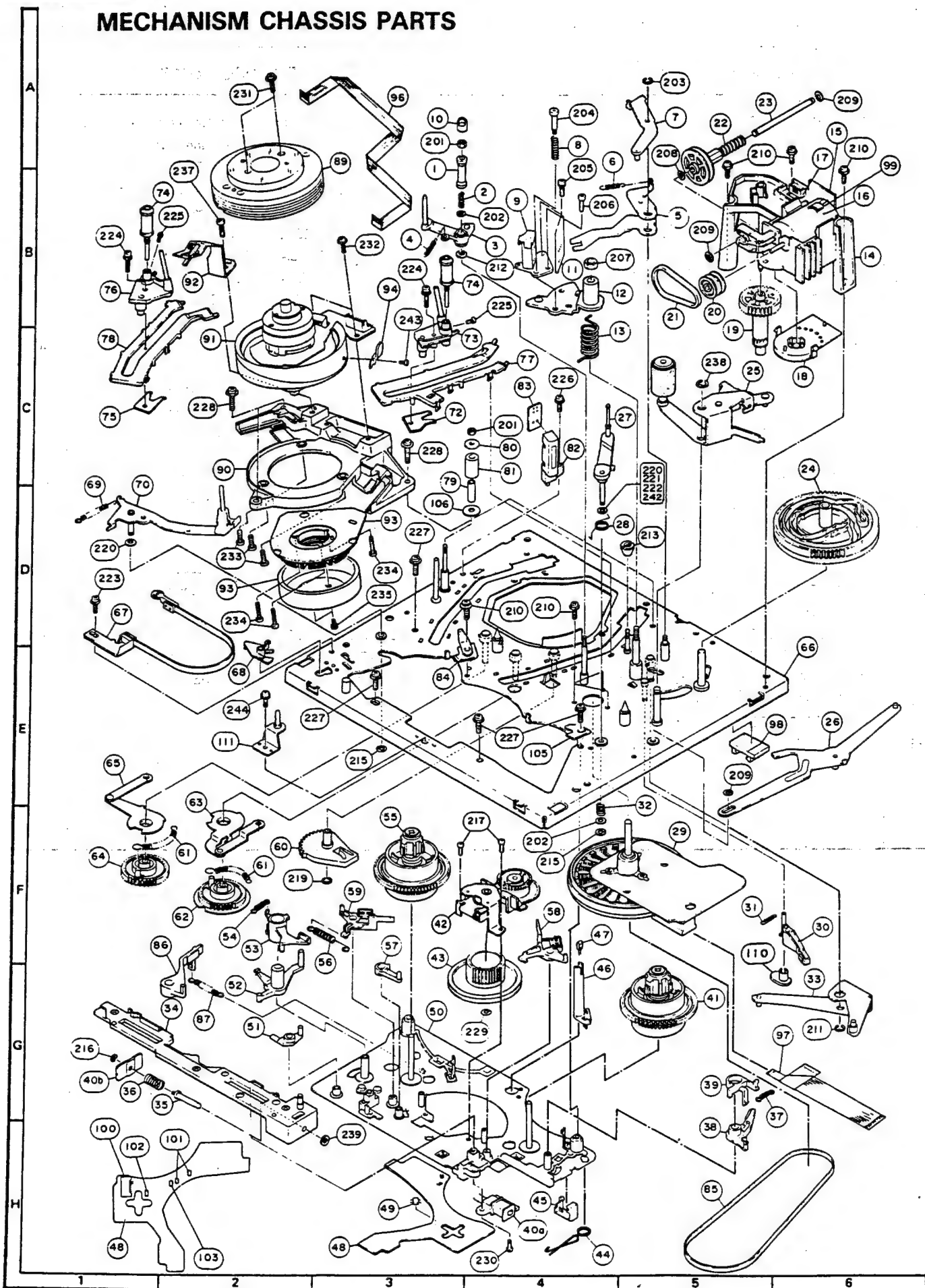
REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
Δ R 907, Δ 924 Δ R 932	95 KUE BBR47 AF 95 KUZ Z 0031Z Z	0.47 ohm, 1/4W, Fusible resistor 6.8 ohm, 1/2W, Metal oxide	AC AF	MISCELLANEOUS			
				SW 01	92PSSSS22388A	Switch, TV/VCR	AE
MISCELLANEOUS				CABINET PARTS			
Δ	Q ACCZ3005 GEZZ or	AC Cord	AM	92 PFA11D6803	Cabinet (A)	AM	
Δ	Q ACCV2024 GEZZ		AM	92 PFA11E1701	Cabinet (B)	AK	
Δ F 901	95 K PJ C0473 ZZ or	Fuse, T2A, 250V	AD	92 PFA11D2101	Cabinet (C)	AD	
	95 K PJ C0178 ZZ		AD	92 PFA58A6601	Filter	AE	
Δ F 903	95 K PJ C0485 ZZ or	Fuse, T3.15A, 250V	AD	92 PFA42B2405	Rubber key	AT	
	95 K PJ C0114 ZZ		AG	92 PFA42B0205	Rubber key	AH	
Δ ICP 901	95 K PJ C0282 ZZ	SSFR 1A, 125V	AG	92 PFA61A8806	Button	AD	
PA	95 K EC B7313 ZZ	Plug, 9 pin	AH	92 PFA62B1738	Name plate (A)	AN	
PB	95 K PK Z0442 ZZ	Plug, 2 pin	AB	92 PFA62A9709	Name plate (B)	AG	
PC	95 K PK Z0194 ZZ	Plug, 2 pin	AC	92 P3ETFA9701	Battery terminal (A)	AC	
INFRARED REMOTE CONTROL CIRCUIT				92 P3ETFA9801	Battery terminal (B)	AB	
	RRMCG0537GESA	Infrared Remote Control Unit	BD	92 P3ETFA9601	Battery terminal (C)	AB	
TRANSISTOR				92 P2 A502100	Screw	AA	
Q 1	92 P3TSN0005T	2SC2411K	AD	92 P2 A391060	Screw	AA	
INTEGRATED CIRCUIT				92 P3 ELFA048	LCD	AX	
IC01	92 P3 SQ00167	M34201M4-117FP	AY	92 P3ECFA0011	Connector	AF	
DIODES AND CRYSTAL				92 PFA23A5001	Spacer	AD	
D 01	92 P3 QH00019	SLR932A-1-A (LED)	AE	THE OTHER PARTS			
D 1, 2, 3, 4, 7, 8, X 2	92 P3TSD0007T 92 P3 EQ00010	DAN202K 32.768KHz (Crystal)	AC AH	QCNW -2304GEZZ	Connecting cord	AL	
COIL				Ti NS - 1308GEZZ	Operation manual	AG	
X 1	92 P3 E F00021	455KHz	AE	MECHANISM CHASSIS PARTS			
				1	PG i DS0023GEFW	Retaining Guide	AE
				2	MS PRC0142GEFJ	Retaining Guide Spring	AA
				3	M LE VC0022GEZZ	Half-Loading Lever	AF
				4	MS PRT 0270GEFJ	Half-Loading Lever Spring	AA
				5	M LEVF0284GEFW	Half-Loading Drive Lever	AC
				6	MS PRT 0269GEFJ	Half-Loading Reciprocating Spring	AA
				7	M LEV F0283GEZZ	Half-Loading Reciprocating Lever	AB
				8	MS PRC0144GEFJ	Azimuth Spring	AA
				9	RH EDU0070GEZZ	Audio/Control Head Ass'y	AS
				10	PCA P S1015GEZZ	Retaining Guide Cap	AA
				11	QPW BF2888GEZZ	Audio/Control Head PWB	AB
				12	M LEV F0292GEZZ	Audio/Control Head Arm	AD
				13	MS PRD0087GEFJ	Audio/Control Head Arm Spring	AA
				14	LH LD Z1606GEZZ	Loading Block Holder Ass'y	AC
				15	Q P RBF2886GEZZ	Loading Block PWB	AD
				16	RM6 TM1049GEZZ	Loading Motor	AM
				17	Q PLG N0529TAZZ	Plug, 5 pin (MG)	AB

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
18	Q SW- R0023GEZZ	Cam Switch	AF	70	M LEV F0291GEZZ	Tension Arm Ass'y	AF
19	NG ERW1032GEZZ	Worm Wheel	AC	72	MSL i F0042GEFW	Take-Up Pole Base Slider	AB
20	N PLY V0133GEZZ	Loading Motor Pulley	AC	73	LP 6 LM0033GEZZ	Take-Up Pole Base Ass'y	AG
21	N BLT K0058GE00	Loading Belt	AA	74	NR 6 LP0062GEZZ	Guide Roller Ass'y	AE
22	NG ERW1031GEZZ	Worm Ass'y	AC	75	MSL i F0041GEFW	Supply Pole Base Slider	AB
23	NS F TG0045GEFJ	Worm Shaft	AB	76	LP 6 LM0032GEZZ	Supply Pole Base Ass'y	AG
24	NGERH 1118GEZZ	Master Cam	AC	77	PG i DM0066GEZZ	Take-Up Loading Rail	AB
25	M LEV F0281GEZZ	Pinch Roller Lever Ass'y	AN	78	PG i DM0067GEZZ	Supply Loading Rail	AB
26	M LEV F0290GEZZ	Relay Shifter Lever	AE	79	NSFT L0563GEFW	Supply Impedance Roller	AC
27	M LE VC0023GEZZ	Reverse Guide	AG			Innor	
28	MS PRD0086GEFJ	Reverse Guide Spring	AA	80	PG i DH0031GEFW	Supply Impedance Roller	AA
29	RM 6TN2019GEZZ	Capstan D.D. Motor	AZ			Flange	
30	M LEV P0136GEZZ	Slow Brake Lever	AA	81	NR 6 LP0056GEZZ	Supply Impedance Roller	AD
31	MS PRT0276GEFJ	Slow Brake Spring	AA	82	RH EDT 0026GEZZ	Full Erase Head Ass'y	AK
32	MS PRC0151GEFJ	Reverse Guide Spring	AA	83	Q PWBF2936GEZZ	Full Erase Head PWB	AA
33	M LEV F0289GEZZ	Relay Gear Drive Lever	AE	84	LA NGA 0054GEZZ	Supply Reel Stopper Ass'y	AD
34	MSL i F0043GEZZ	Brake Shifter	AK	85	N BLT K0059GE00	Reel Belt	AB
35	NS FT Z0068GEFD	Brake Lock Shaft	AC	86	M LEV P0146GEZZ	Auxiliary Fast-Forward Brake	AE
36	MS PRC0143GEFJ	Absorber Plate Spring	AB			Lever	
37	MS PRT0274GEFJ	Video Search Spring	AB	87	MS PRT0282GEFJ	Auxiliary Fast-Forward Brake	AB
38	M LEV P0130GEZZ	Video Search Brake Lever	AD			Spring	
39	M LEV P0131GEZZ	Video Search Reciprocating	AC	89	DDR MU0004HE22	Upper Drum Ass'y	BL
		Lever				(VC-780E)	
40	RPLU - 0083GEZZ	Brake Solenoid Ass'y	AF	89	DDR MU0004HE23	Upper Drum Ass'y	BN
41	NDA i V1046GEZZ	Take-Up Reel Disk Ass'y	AG			(VC-790ET)	
42	NGERH 1128GEZZ	Idler Gear Ass'y	AN	90	PG i DC0039GEFW	Drum Base	AL
43	N PLY V0134GEZZ	Reel Pulley	AC	91	DDRM L0012HE00	Low Drum Ass'y (VC-780E)	BE
44	MS PRD0085GEFJ	Shifter Spring	AB	91	DDRM L0012HE02	Low Drum Ass'y (VC-790ET)	BG
45	PC 6 VP1018GEZZ	Shifter Spring Cover	AC	92	Q BRS K0021GEZZ	Earth Brush Ass'y	AC
46	LH LD P1092GEZZ	Cassette LED Holder	AE	93	RM 6T P1099GEZZ	Drum D.D. Motor Ass'y	AW
47	RH - PX0169GEZZ	Cassette LED	AD	94	RH E TP0015GEZZ	Heater	AG
48	Q PWBF2977GEZZ	Reel Sensor PWB	AK	96	Q CNW- 4880GEZZ	Full Flat Cable	AN
49	RH - PX0171GEZZ	Reel Sensor	AE			(Drum D.D. Motor)	
50	LCH S S0016GEZZ	Reel Block Chassis	AL	97	Q CNW- 5313GEZZ	Full Flat Cable	AN
51	M LEV P0134GEZZ	Tension Adjusting Lever	AC			(Capstan D.D. Motor)	
52	M LEV P0133GEZZ	Tension Release Lever	AC	98	LH LDW1109GEZZ	Full Flat Cable Holder	AB
53	M LEV P0132GEZZ	Back Tension Lever	AC	99	R DTCH 0018GEZZ	Dew Sensor	AG
54	MS PRT0273GEFJ	Spring, Fast-Forward	AB	100	Q S 6CN0534REZZ	Socket, 5 pin (MF)	AC
55	NDA i V1047GEZZ	Supply Reel Disk Ass'y	AH	101	VRS - TW2ED221J	220 ohm, 1/4W, 5%,	AA
56	MS PRT0272GEFJ	Main Brake Spring	AC			Oxide Film	
57	M LEV P0135GEZZ	Intermediate Lever	AC	102	VCK YT V1HB102K	1000pF, 50V, 10%, Ceramic	AA
58	M LEV P0129GEZZ	Main Take-Up Brake Lever	AE	103	VRS - TV1J D473J	47k ohm, 1/16W, 5%,	AA
59	M LEV P0128GEZZ	Main Supply Brake Lever	AE			Oxide Film	
60	NGERH 1121GEZZ	Loading Relay Gear	AA	105	LA NGA0051GEFW	Take-Up Reel Disk Catch	AB
61	MS PRT0271GEFJ	Loading Reciprocating	AA			Holder	
		Spring		106	PGI DS 0027 GEZZ	Supply Impedance Roller	AA
62	NGERH 1120GEZZ	Take-Up Loading Gear	AA			Flange (Low)	
63	M LEV F0286GEZZ	Take-Up Loading Arm Ass'y	AC	110	PCA PS 1018GEZZ	Slow Brake Shaft Cap	AA
64	NGERH 1119GEZZ	Supply Loading Gear	AA	111	LA NG F7061GEZZ	Release Pin Angle Ass'y	AC
65	M LEV F0285GEZZ	Supply Loading Arm Ass'y	AC				
66	LC HSM0091GEZZ	Main Chassis Ass'y	AR				
67	LB N DK1002GEZZ	Tension Band Ass'y	AD				
68	LH LDZ 1607GEZZ	Tension Spring Hook Plate	AA				
69	MS PRT0275GEFJ	Tension Spring	AA				

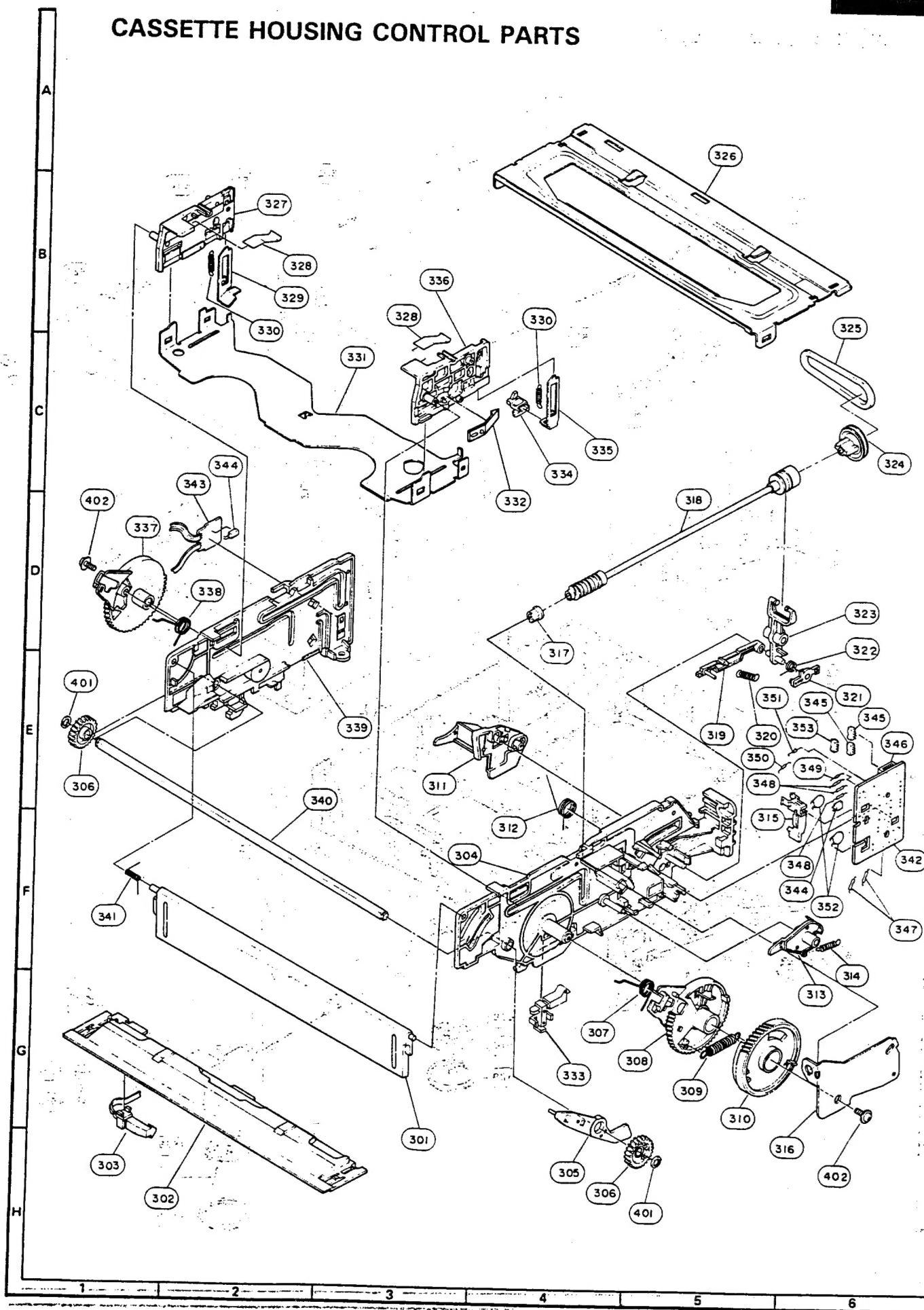
REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
CASSETTE HOUSING CONTROL PARTS				349	VRD - RA2BE332J	3.3k ohm, 1/8W, 5%, Carbon	AA
	CH LDX3051GE00	Cassette Housing Control Assembly	AY	350	VRD - RA2BE472J	4.7k ohm, 1/8W, 5%, Carbon	AA
301	HDECQ 0558GESA	Cassette Cover	AG	351	VRD - RA2BE103J	10k ohm, 1/8W, 5%, Carbon	AA
302	PG I DM0069GE00	Down Guide	AC	352	VCT Y PA1EX473M	0.047μF, 25V, 20%, Ceramic	AA
303	Q SW- F0034GEZZ	Cassette Erase Protection Switch	AC	353	VSDTC124F // - 1	Transistor	AC
304	LH LDX 1008GE00	Cassette Housing Frame (R)	AF	401	LX - WZ1020GE00	Cut Washer (4.2W-6.0-0.5)	AA
305	MA RMP0038GEZZ	Cassette Cover Arm	AB	402	LX - HZ 3046GEFD	Screw BTN3P+6S (F)	AA
306	NG ERW1036GEZZ	Phase Gear	AA	SCREWS, NUTS, WASHERS AND WIRE CLAMP			
307	MS PRD0088GEFJ	Drive Gear Spring (R)	AA	201	LX - NZ 3039GEZZ	Adjusting Nut	AA
308	NG ERW1034GEZZ	Drive Gear (R)	AB	202	XWHS26 - 05060	Washer W2.6S-6-0.5	AA
309	MS PRT0277GEFJ	Reciprocating Spring	AA	203	XRESJ 20 - 04000	E Ring-2	AA
310	NG ERW1033GEZZ	Worm Wheel Gear	AB	204	LX - BZ 3095GEFD	AC Head Screw	AA
311	M LEV P042GE00	Open Lever	AA	205	XB PSD26 P06000	Azimuth Adjusting Screw	AA
312	MS PRD0091GEFJ	Open Lever Spring	AA	206	LX - BZ 3096GEFD	Tilt Adjusting Screw	AA
313	M LEV P0141GEZZ	Switching Lever	AA	207	XN FSD40 - 31000	Adjusting Nut (A/C Head)	AB
314	MS PRT0280GEFJ	Switching Lever Spring	AA	208	XWHJZ31 - 05054	Washer W3.1-5.4-0.5	AA
315	Q SW- F0040GEZZ	Cassette Switch	AD	209	LX - WZ1041GE00	Washer W2.6-6-0.5 (LM)	AA
316	LA NGF9355GEFW	Worm Bracket	AB	210	XH PSD26P06WS0	Screw C2.6P+6S	AA
317	NB RGP0013GEZZ	Bearing	AA	211	LX - RZ 3001AEZZ	E Ring-3	AA
318	NS FT D0016GEZZ	Worm Shaft Ass'y	AE	212	XWHJ Z45 - 02060	Washer PSW4.6-6-0.25	AA
319	M LEV P0140GEZZ	Clutch Lock Lever	AA	213	LX - NZ4043GEFW	Adjusting Nut	AB
320	MS PRT0279GEFJ	Clutch Lock Lever Spring	AA	215	LX - WZ1003GE00	Washer CW2.1-5-0.5	AA
321	M LEV P0139GEZZ	Clutch Release Lever	AA	216	XRESJ 12 - 03000	E Ring-1.2	AA
322	MS PRD0092GEFJ	Clutch Release Lever Spring	AA	217	XB PSD26 P03000	Screw 2.6P+3S	AA
323	M LEV P0138GEZZ	Clutch Lever	AA	219	XRESJ 25 - 04000	E Ring-2.5	AA
324	N PLY V0135GEZZ	Pulley	AA	220	XWHJ Z25 - 05050	Washer W2.6-5-0.5	AA
325	NB LT K0060GE00	Cassette Loading Belt	AB	221	XWHJ Z25 - 01050	Washer W2.6-5-0.13	AA
326	LA NGF9354GEFW	Upper Plate	AD	222	XWHJ Z25 - 02050	Washer W2.6-5-0.25	AA
327	LH LDX 1013GE00	Slider Holder (L)	AB	223	LX - HZ 3043GEZZ	Screw W2.6P+6S	AA
328	MS PRP0115GEFJ	Cassette Spring	AB	224	LX - BZ 3099GEZZ	Screw WSW2P+11S-5W	AB
329	LA NGF9357GEFW	Slider Lock (L)	AA	225	LX - XZ 3030GEFD	Screw M2x4	AC
330	MS PRT0281GEFJ	Slider Lock Spring	AA	226	XH PSD26P08WS0	Screw C2.6P+8S	AA
331	MSLI F0044GEFW	Slider	AF	227	XJ PSD26 P08WS0	B Tight Screw C2.6P+8S	AA
332	MA RMP0039GEZZ	Lock Release Lever Ass'y	AA	228	XH PSD30P08WS0	Screw C3P+8S	AA
333	Q SW- F0037GEZZ	Auto Load Switch	AD	229	LX - WZ1040GE00	Washer CW2.5-6-0.5	AA
334	M LEV P0143GE00	Slider Lock Cover	AA	230	XJ BSD20 P06000	B Tight Screw 2P+6S	AA
335	LA NGF9356GEFW	Slider Lock (R)	AA	231	LX - BZ 3039GEFN	Screw W3P+9S-Ni	AA
336	LH LDX 1012GE00	Slider Holder (R)	AB	232	LX - HZ 3045GEFD	Screw S3P+8S-6W	AA
337	NG ERW1035GEZZ	Drive Gear (L)	AB	233	LX - BZ 3064GEFN	Screw SW3P+6S-Ni	AA
338	MS PRD0089GEFJ	Drive Gear Spring (L)	AA	234	XB PSD26 P12J00	Screw SW2.6P+12S	AA
339	LH LDX 1009GE00	Cassette Housing Frame (L)	AF	237	XH PSD30P06000	Screw	AA
340	NS F TD0015GEFD	Main Shaft	AD	238	LX - RZ 3001AEZZ	E Ring (Curl)	AA
341	MS PRD0090GEFJ	Cassette Cover Spring	AA	239	LX - WZ1042GE00	Washer CW2.7-7-0.5	AA
342	Q PWBF3194GEZZ	Start Sensor PWB	AC	242	XW HJ Z25- 04050	Washer W2.6-5-0.4	AA
343	Q PWBF2894GEZZ	End Sensor PWB	AB	243	XB PSD30 P04J00	Screw SW3P+4S	AA
344	RH - PX 0053GEZZ	Phototransistor	AF	244	XH PSD30P04WS0	Screw C3P+4S	AA
345	VS2SA937 - Q / -1	Transistor	AC				
346	Q S 5CN0595GEZZ	Socket, 5 pin	AB				
347	VRD - RA2BE153J	15k ohm, 1/8W, 5%, Carbon	AA				
348	VRD - RA2BE223J	22k ohm, 1/8W, 5%, Carbon	AA				

REF.NO.	PART NO.	DESCRIPTION	CODE	REF.NO.	PART NO.	DESCRIPTION	CODE
MECHANICAL PARTS				FRONT PANEL PARTS			
601	GC ABB1081GEZZ	Bottom Cabinet	AR	500	CP N LC1578GE01	Front Panel Ass'y (VC-780E)	BB
602	GC ABA3044GES3	Upper Cabinet	AR	500	CP N LC1578GE02	Front Panel Ass'y (VC-790ET)	BB
603	GB DYU3052GEZZ	Bottom Plate	AG				
604	GC 6 VA1537GEZZ	Antenna Terminal Plate	AF	501	C BTN - 2225GE01	Button, Ass'y, Power	AC
605	PZ E TV0354GEZZ	Insulator	AE	501-1	J BTN - 2225GESA	Button, Power	AB
607	LH LDP 1095GEZZ	LED Holder	AD	501-2	GC 6 VA1498GEZZ	Cover LED	AB
608	Q EARP0276GEFW	Earth Plate	AA	502	GD 6RF1597GESA	Door (VC-780E)	AH
609	MS PRC0145GEFJ	Power Earth Spring	AA	502	GD 6RF1613GESA	Door (VC-790ET)	AH
610	XE BSD30 P12000	Screw	AA	503	TC AU H3179GEZZ	Dew Caution Label	AB
611	XH PSD30P06WS0	Screw	AA	504	H BDGB3013GESA	Badge, "SHARP"	AC
612	XE BSD40 P12000	Screw	AA	505	GC 6 VA1425GEZZ	Infrared Remote Control Filter	AC
614	LX - HZ 3040GEFF	Screw	AA				
615	LH LDF 1078GEZZ	PWB Holder	AA	506	H DECQ0541GESA	Decoration Plate	AG
617	LH LDZ 1614GE00	Fluorescent Display Holder	AC	507	H I NDP1569GESA	Indecation Plate	AG
618	T LABH 0434GEZZ	VR Label	AA	508	J BTN - 2226GESA	Button, Eject	AB
619	T LAB M1736GEZZ	Model Label (VC-780E)	AB	509	J BTN - 2227GESA	Button, REC.	AA
619	T LAB M1746GEZZ	Model Label (VC-790ET)	AB	510	LH LDZ 3035GEZZ	Holder	AD
621	J K NBP1051GESA	Slide Switch Knob	AD	511	PC 6 VU9146GESB	Fluorescent Display Filter	AE
622	LX - LZ 1001GEZZ	Push Ribet	AA	512	Q EARP0272GEFW	Earth Plate	AC
623	J K NBP1049GESA	Slide Switch Knob	AB	513	T LAB H0421GEZZ	Tuning Label	AC
624	LH LDP 1089GE00	Power LED Holder	AA	514	T LAB Z0544GEZZ	C-Lock Label	AC
625	LA NGF7060GEFW	Angle	AC	515	H DECP0220GESA	Door Decoration Plate	AF
626	G LEG P9027GEZZ	Pad (R)	AC	516	LA NG F9360GES3	Angle	AE
627	LX - HZ 3047GEFF	Screw	AA	517	LX - NZ 3014CEFN	Nut	AA
628	G LEG P9026GEZZ	Pad (L)	AC	518	T LAB Z0536GEZZ	Titanium Coating Label (VC-790ET)	AC
629	G LEG P9030GESB	Decorative Foot Ass'y	AD				
630	G LEG P9029GEZZ	Rear Foot	AB				
631	PS PA Z0200GEZZ	Spacer	AA				
633	TC A DZ3051GEZZ	SECAM Caution Label	AD				

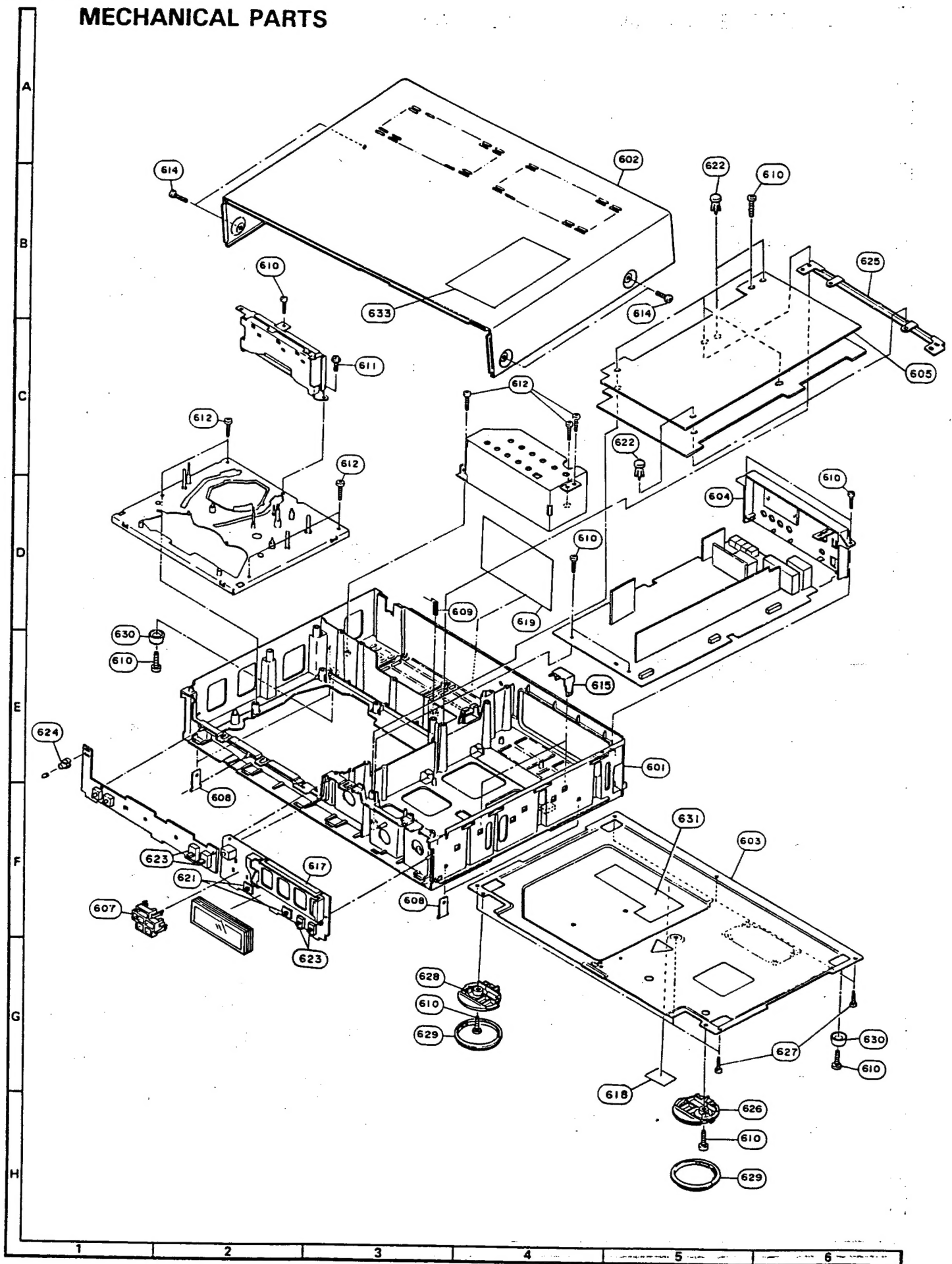
MECHANISM CHASSIS PARTS



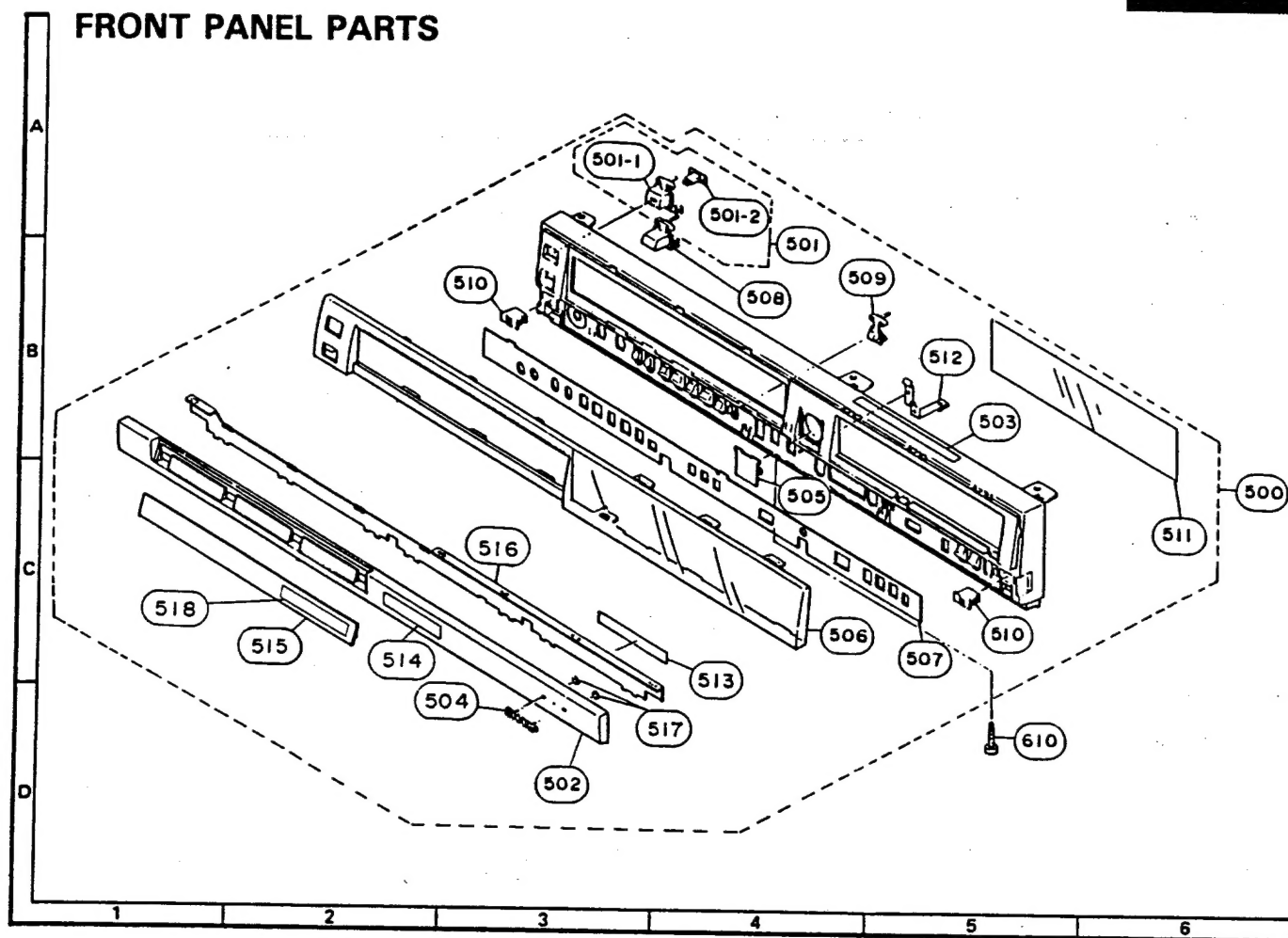
CASSETTE HOUSING CONTROL PARTS



MECHANICAL PARTS



FRONT PANEL PARTS



PACKING OF THE SET

■ Setting positions of the knobs

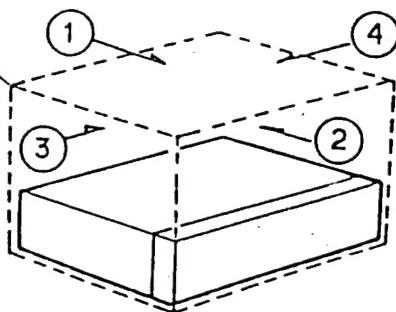
Picture tone knob	at "Center click" position	Color mode switch (1)	at "Auto" position
Full auto switch	at "II" position	Color mode switch (2)	at "Mode 1" position
Counter	at "PAL/MESECAM" position	Band selector switch	at "Normal" position
V-Lock	at "Best point" position	Test signal switch	at "Off" position
System	at "B/G" position		

• Accessories

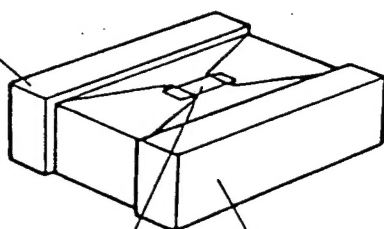
- ★ Ti NS - 1308GEZZ
- ★ QCNW-2304GEZZ
- ★ UK6GD0015CEZZ

Operation manual
Antenna cord
Driver

- ★ SSAKA0030GEZZ
Polystyrene Sack



- ★ SPAKX0497GEZZ
Buffer material (Rear)



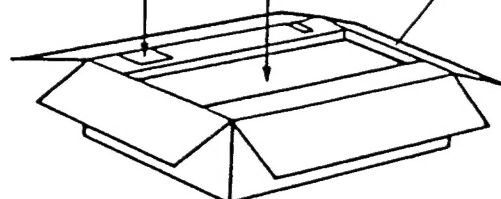
Fix with craft tape

- ★ SPAKX0497GEZZ
Buffer material (Front)

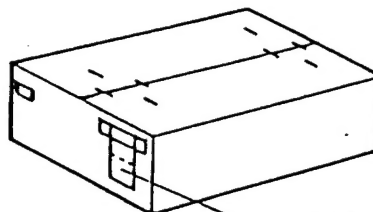
- ★ RRMCG0537GESA
Infrared remote control
unit



- ★ SPAKC1553GEZZ
(VC-780E)
 - ★ SPAKC1565GEZZ
(VC-790ET)
- Packing case



Use 8 staples to fix the
bottom of packing case.



- ★ TLABK1736GEZZ (VC-780E)
 - ★ TLABK1746GEZZ (VC-790ET)
- No. Card

★ Not Replacement Items